

# The Mining Journal

Established 1835

Railway & Commercial Gazette

Vol. CCXLIV No. 6247

LONDON, MAY 13, 1955

PRICE 8d.

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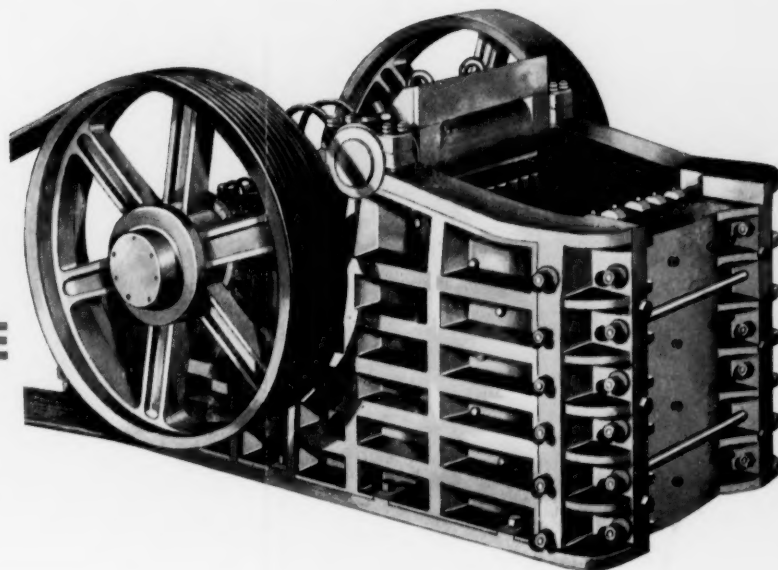
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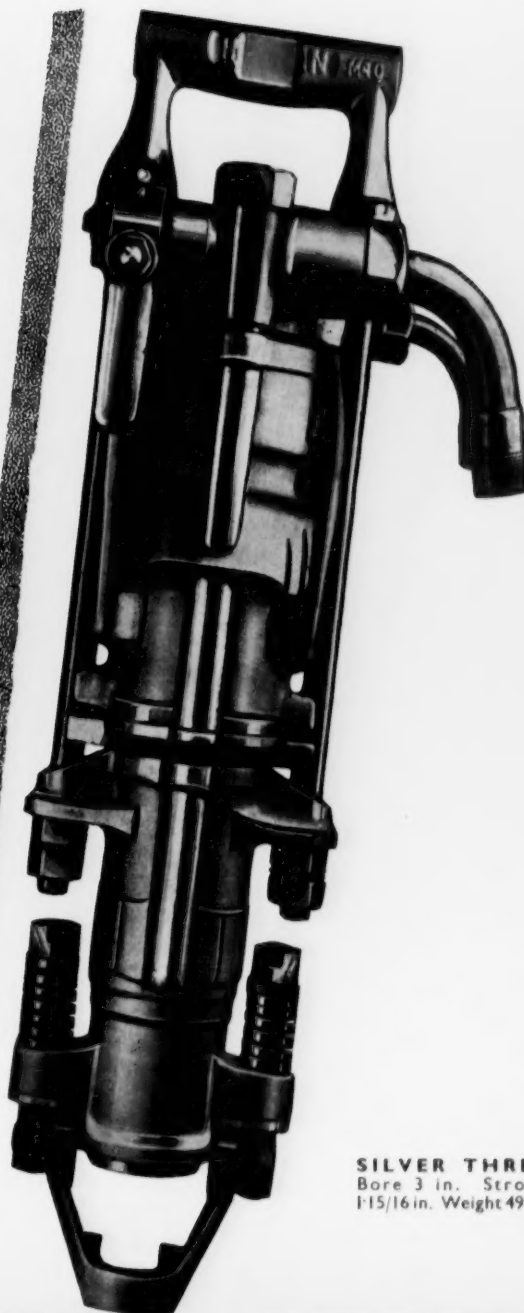
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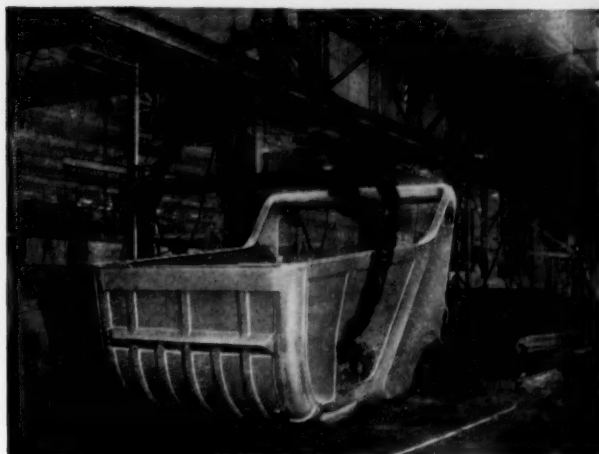
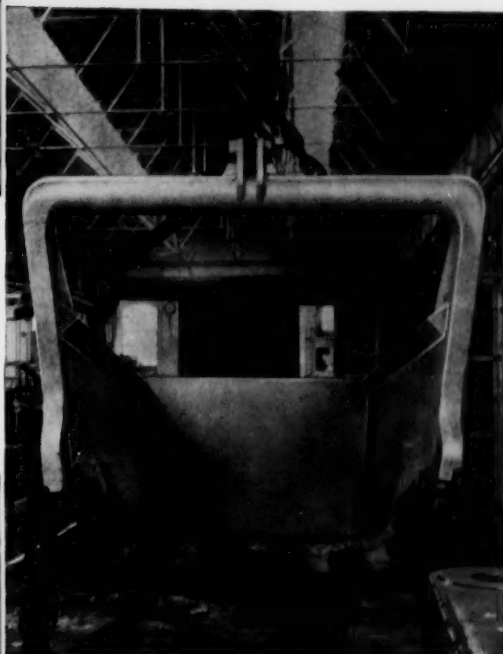


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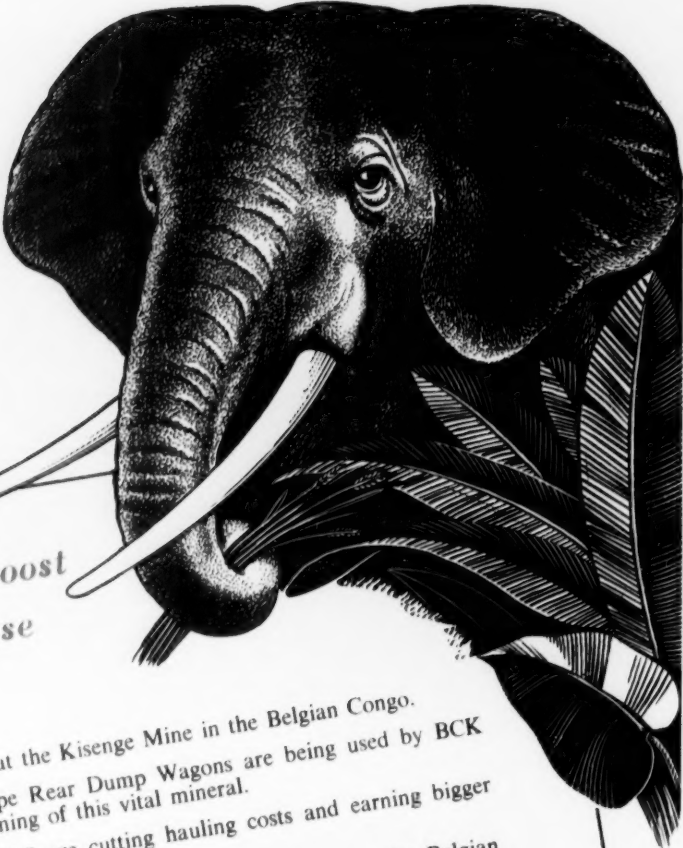


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# **EUCLIDS** boost output of manganese ore in the Congo

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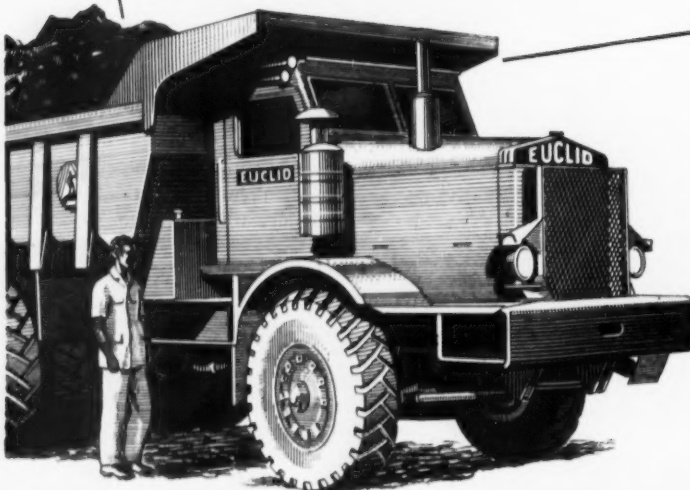
Sixteen EUCLID quarry-type Rear Dump Wagons are being used by BCK Manganese to speed the mining of this vital mineral.

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## NOTES AND COMMENTS

### U.S. Foreign Trade Bill Approved

President Eisenhower's Foreign Trade Bill is at last through the Senate, passed by the comfortable majority of 75 to 13 as it was passed handsomely in the House of Representatives by 295 to 110. But in the Committees of both Houses the voting was desperately close (a majority of one saved the Bill from defeat in the Representatives), the Protectionists seconded a number of amendments, and, it is believed, the President has had to make certain promises about the interpretation of the Bill which will come to light only after it has become law.

The main provisions—an extension of reciprocal trade agreements for three years and an authorization to negotiate tariff reductions of 15 per cent to cut tariffs to 50 per cent when they exceed this amount—remain intact. That the Bill got through at all was due to the endeavour of Speaker Rayburn in the House and to the decision of the President to throw in his personal prestige when the Bill became bogged down in the Senate. The President may thus get some satisfaction from the result; but before extolling Mr. Eisenhower's prestige it is well to remember that this is the second time he has presented the Bill to Congress and if he had failed again—as he very nearly did—that prestige would have totally evaporated.

Furthermore, in order to lesson the dangers to the Bill all other measures which may have incensed the Protectionists have had to be put into cold storage. One, the Customs Simplification Bill was produced as soon as the Senate vote was known. But the President has still to decide on the recommendation of the Tariff Commission that import duties on bicycles should be revised, the future of stockpiling of lead and zinc is still not clear and Congressional approval of the new Organization for Trade Co-operation is not being pressed. All this gives some idea of the current strength of Protectionist feeling in the United States; indeed what seems to be emerging is a situation in

which the Administration and the leaders of both parties are always liberal while their parties at large, reflecting local interests, are always protectionist.

In such a situation Congressmen will bend to both according to whether they think enjoying the friendship of the party leaders, or keeping in with the boys back home will be the more useful when elections come round. For what has happened in the past few years is that American industry has so spread that few states are without an influential industrial (which is almost the same thing as protectionist) interest. Oil, lead, zinc and coal mining and the manufacture of chemicals, bicycles and motor bicycles, gloves, pottery, cutlery, textiles, watches, electrical equipment etc. cover pretty nearly all the United States. The second thing that has happened is that given the farm price support programme agriculture cannot be anything but protectionist. And the third thing is that the erstwhile solid Democratic and free trade south has experienced both the other movements; it has acquired a wide range of protection-seeking industry and a large part of its cotton is virtually unsaleable without an export subsidy; the one sure bulwark against the Protectionists has thus disappeared.

So that although the passage of the Foreign Trade Bill represents a considerable victory for the Administration the Protectionists are by no means discredited or dispersed. Indeed their forces will certainly regroup towards the end of the year when the Presidential elections have in sight.

### Wankie Colliery's Potential Opencast Operations

Due to the improved efficiency at Wankie Colliery, the increased railage facilities and greater sales, a decrease in the price of coal from November next was confidently predicted by Mr. G. A. Davenport, the Southern Rhodesia Minister of Mines, Lands and Surveys in his speech at the annual meeting of the Chamber of Mines of Rhodesia held in Salisbury towards the end of last month.



Wankie Colliery was now meeting all demands and the company had agreed to reserve a large part of its area for future opencast operation. The area to be set aside, he said, contained about 100,000,000 tons of coal. To tackle the deposits in the most efficient manner the Rhodesian Anglo American Company were sending men to the United States to study that country's techniques of producing coal by opencast methods. However, operations were unlikely to begin until demand, particularly for the rather inferior top coal, showed a considerable expansion. The company, therefore, would be able to meet the demand for any coal for an oil-from-coal industry or any similar industry which might be started.

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Speaking in a more practical context, Mr. Joubin said that while nothing was yet known of the cost of electricity derived from uranium, he believed that by 1962 this form of power should be competitive with electricity derived from steam boilers—although it would take longer to be competitive with hydro-electric power.

#### Hurlbutite Found in Southern Rhodesia

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The significance of hurlbutite is that it has an appreciably higher beryllium oxide content than beryl and if found in sufficient quantities it could be used in beryllium alloys for the manufacture of such articles as high tension springs.

## Australia

(From Our Own Correspondent)

Melbourne, April 20.

Electrolytic Zinc Co. of Australasia Ltd. has been advised by the Hydro-Electric Commission of Tasmania that because of deterioration of the water storages caused by a long period of dry weather in Tasmania, the supply of power to the company will be cut by 20 per cent. This cut will apply both to the Risdon electrolytic zinc works and to the company's lead-zinc-copper mines on the West Coast of the Island. The cut in the power supply will mean a reduction in zinc production at the rate of about 20,000 tons of zinc per year.

The position is particularly unfortunate for during the year the production rate had passed 100,000 tons per annum; the total production for the year ended June 30, 1954, was 99,201 tons, and for the first 36 weeks of the current financial year output was 72,013 tons. The restriction will also affect the sulphate of ammonia works, which are awaiting supply of adequate power to come into production. At the West Coast mines, increased output of ore and concentrates has been planned.

While Tasmania has been experiencing a long period of deficient rainfall, the northern, eastern, and part of the western sides of Australia have suffered the worst floods in history.

#### THE COPPER INDUSTRY

The decision of the Tariff Board, on the recent approach by the copper producers for protection that would ensure a satisfactory price and the future stability of the industry, is regarded unfavourably by producing companies. The Board found that there would be no need to impose duties or pay bounties so long as producers of basic copper could obtain a price of £A250 or more for their product. Free admission of unrefined copper from all sources was recommended and a duty on refined copper of £4 per ton.

Australian copper mines are all in remote localities and coastal shipping freights to the refinery at Port Kembla are high, and a serious burden on costs. Actually, Mount Isa copper can be shipped from Townsville to any other part of the world at a cheaper cost than from Townsville to Port Kembla. Refining charges in Australia are also very much higher than overseas refining charges.

In the course of the enquiry the Board did not visit any major producer of copper in North Australia to examine the problems of production and marketing. In past years, Australian producers have received less than world parity, because of price control, which control was abandoned in the close of 1954. The recent abnormal rise in the price of copper gives present prosperity, but an adequate measure of security is imperative if the industry is to survive any marked fall in price. This guarantee of security, the industry has, so far, failed to obtain.

Electrolytic Refining and Smelting Co. at Port Kembla, New South Wales, is the only Australian refinery, receiving blister copper from Mount Lyell, Mount Morgan, and part of the Mount Isa output. The capacity of the Port Kembla works is 32,500 tons of refined copper per year and portion of Mount Isa production is, of necessity, exported for refining overseas.

About 85 per cent of this copper exported for refining, or about 4,900 tons, is re-imported. This, with Australian electrolytic refined copper, amounts to about 40,000 tons, and Australian demand is about 60,000 tons, so that it will be necessary to import approximately 20,000 tons to meet requirements.

# The Annual Dinner of the Institution of Mining and Metallurgy

H.R.H. The Duke of Edinburgh was the principal guest at the Annual Dinner of the Institution of Mining and Metallurgy at Grosvenor House, London, on May 6, which was attended by about 320 members and their guests under the chairmanship of their President, Brigadier R. S. G. Stokes.

The Toast of "The Institution" was proposed by the Duke of Edinburgh, who said that while he did not know very much about metals he had seen something of mining and metallurgy in Australia and in Canada. Unfortunately he had not had any experience as yet of South African mining. The Duke declared that he had accepted the invitation to the dinner because he "wanted to see what mining engineers and geologists looked like." The only background he had for his knowledge of the mining profession was provided from the verses of Robert W. Service, two of whose poems—"The Lone Trail" and "The Cremation of Sam McGee"—he proceeded to quote at length.

## GLOBAL CHARACTER OF I.M.M.

Speaking in a more serious vein, the Duke believed that the demand for metals would increase in volume and thus the civilized world depended on members of the mining profession to find the metals, mine them and finally to refine them. He hoped the Institution would continue to go on from strength to strength.

The President, in responding to the toast, paid a tribute to the untiring services which the Duke rendered to industries, enterprises, and all good causes throughout the Commonwealth and Empire. He went on to say that this was the fortieth anniversary of the granting of the Royal Charter. The industry and the Society's membership had seen many changes during that time. The great majority of members of the Institution had always been overseas, but at the time the Royal Charter was obtained many of them were in Russia, Siberia, Korea, China, and countries such as those. Since then the numbers had increased, but the members were at work mostly in happier lands, and particularly on the continent of Africa, where, as in Canada, there were still vast territories to explore. The Institution was being reminded that evening of its global character, because messages had been received from all members of Council who were abroad—from Australia, New Zealand, Malaya, India, the Union of South Africa, Southern and Northern Rhodesia, East and West Africa, the United States, and Canada.

## ELABORATION OF TECHNIQUE

The President continued to speak of other changes besides the location of members. Years ago it was much easier for the mining engineer to follow the activities of his colleagues the geologists and the metallurgists, but now with increasing elaboration of technique it was sad to watch the strained faces of mining engineers trying to follow their partners in these adjacent fields of science. Adventure was in the lifeblood of the mining engineer, and the profession had adventure to offer, although it might not be exactly of the pattern written about by Mr. Robert Service. It was, moreover, intellectual as well as physical adventure. He referred to the discovery of uranium in the ore of the Witwatersrand. For a long time it was regarded as of academic interest, and it took 20 years before it was realized

that the greatest uranium deposits in the world awaited them.

Mr. Stanley Robson, President-elect, proposed the health of the guests. These included the High Commissioners for South Africa and the Federation of Rhodesia and Nyasaland, the Chief Inspector of Mines (Sir Harold Roberts), and the Director of the Geological Survey (Dr. W. J. Pugh). Too small a proportion of schoolboys of first-class ability had their interests directed to the mining profession, and the Institution was glad to welcome the presence of three headmasters (Merchant Taylors, Haileybury, and Harrow), also the chairman of governors of the Camborne School of Metalliferous Mining (Mr. Donald W. Thomas) and the rector of the Imperial College of Science (Dr. R. P. Linstead), whom he congratulated upon his recent appointment. Other guests included the presidents of kindred institutions and the presidents of some of the great mining concerns. He coupled the toast with the name of Lord Baillieu, chairman of the Empire Council of Mining and Metallurgical Institutions, and spoke of his great service at Washington during the war as head of the British Raw Materials Commission.

Lord Baillieu paid a tribute to the Duke of Edinburgh for his evident understanding, shown on this and other occasions, of the problems of industry in this country. His Royal Highness knew as they all knew that their standard of living, their way of life, the happiness and prosperity of British folk depended upon the efficiency of British industry, and if there was not enough production to buy their food and to procure the raw materials which sustained industry the days of this Commonwealth and Empire as a great Power were numbered.

## DEVELOPMENT UNDER ADVERSE CONDITIONS

His own earliest contacts with the mining industry were at Broken Hill. His father with other colleagues received the Gold Medal of the Institution, the highest honour in its power to bestow, and he himself shared with His Royal Highness the privilege of being one of the Institution's Honorary Members. Their President and he had been colleagues since the war in Africa, in Canada, in Australia, in Trinidad, and at home, and had shared common responsibilities. It was his belief that when the history of these times came to be written and the balance cast up, people would wonder how, in the face of two world wars, economic depressions, heavy taxation, and other sundry troubles, so much development had taken place in so short a space of time. For that result a great deal of credit must be given to the members of that Institution.

It had been his privilege during the years to work in close association with many of them, and he knew of their difficulties, even though directors of mining companies perhaps looked at matters from a rather different point of view on occasion from that of their technical advisers. They were confronting now a changing world, the dawn of the atomic age, but he believed that this country in the future as in the past would meet these challenges, and that England as the heart and core of the Commonwealth would continue to give of its best. No better record could be found than that which stood behind the mining and metallurgical industry of this country, and he raised his glass to its continued well-being.

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The decision of the Tariff Board, on the recent approach by the copper producers for protection that would ensure a satisfactory price and the future stability of the industry, is regarded unfavourably by producing companies. The Board found that there would be no need to impose duties or pay bounties so long as producers of basic copper could obtain a price of £A250 or more for their product. Free admission of unrefined copper from all sources was recommended and a duty on refined copper of £4 per ton.

Australian copper mines are all in remote localities and coastal shipping freights to the refinery at Port Kembla are high, and a serious burden on costs. Actually, Mount Isa copper can be shipped from Townsville to any other part of the world at a cheaper cost than from Townsville to Port Kembla. Refining charges in Australia are also very much higher than overseas refining charges.

In the course of the enquiry the Board did not visit any major producer of copper in North Australia to examine the problems of production and marketing. In past years, Australian producers have received less than world parity, because of price control, which control was abandoned in the close of 1954. The recent abnormal rise in the price of copper gives present prosperity, but an adequate measure of security is imperative if the industry is to survive any marked fall in price. This guarantee of security, the industry has, so far, failed to obtain.

Electrolytic Refining and Smelting Co. at Port Kembla, New South Wales, is the only Australian refinery, receiving blister copper from Mount Lyell, Mount Morgan, and part of the Mount Isa output. The capacity of the Port Kembla works is 32,500 tons of refined copper per year and portion of Mount Isa production is, of necessity, exported for refining overseas.

About 85 per cent of this copper exported for refining, or about 4,900 tons, is re-imported. This, with Australian electrolytic refined copper, amounts to about 40,000 tons, and Australian demand is about 60,000 tons, so that it will be necessary to import approximately 20,000 tons to meet requirements.



# The Annual Dinner of the Institution of Mining and Metallurgy

H.R.H. The Duke of Edinburgh was the principal guest at the Annual Dinner of the Institution of Mining and Metallurgy at Grosvenor House, London, on May 6, which was attended by about 320 members and their guests under the chairmanship of their President, Brigadier R. S. G. Stokes.

The Toast of "The Institution" was proposed by the Duke of Edinburgh, who said that while he did not know very much about metals he had seen something of mining and metallurgy in Australia and in Canada. Unfortunately he had not had any experience as yet of South African mining. The Duke declared that he had accepted the invitation to the dinner because he "wanted to see what mining engineers and geologists looked like." The only background he had for his knowledge of the mining profession was provided from the verses of Robert W. Service, two of whose poems—"The Lone Trail" and "The Cremation of Sam McGee"—he proceeded to quote at length.

## GLOBAL CHARACTER OF I.M.M.

Speaking in a more serious vein, the Duke believed that the demand for metals would increase in volume and thus the civilized world depended on members of the mining profession to find the metals, mine them and finally to refine them. He hoped the Institution would continue to go on from strength to strength.

The President, in responding to the toast, paid a tribute to the untiring services which the Duke rendered to industries, enterprises, and all good causes throughout the Commonwealth and Empire. He went on to say that this was the fortieth anniversary of the granting of the Royal Charter. The industry and the Society's membership had seen many changes during that time. The great majority of members of the Institution had always been overseas, but at the time the Royal Charter was obtained many of them were in Russia, Siberia, Korea, China, and countries such as those. Since then the numbers had increased, but the members were at work mostly in happier lands, and particularly on the continent of Africa, where, as in Canada, there were still vast territories to explore. The Institution was being reminded that evening of its global character, because messages had been received from all members of Council who were abroad—from Australia, New Zealand, Malaya, India, the Union of South Africa, Southern and Northern Rhodesia, East and West Africa, the United States, and Canada.

## ELABORATION OF TECHNIQUE

The President continued to speak of other changes besides the location of members. Years ago it was much easier for the mining engineer to follow the activities of his colleagues the geologists and the metallurgists, but now with increasing elaboration of technique it was sad to watch the strained faces of mining engineers trying to follow their partners in these adjacent fields of science. Adventure was in the lifeblood of the mining engineer, and the profession had adventure to offer, although it might not be exactly of the pattern written about by Mr. Robert Service. It was, moreover, intellectual as well as physical adventure. He referred to the discovery of uranium in the ore of the Witwatersrand. For a long time it was regarded as of academic interest, and it took 20 years before it was realized

that the greatest uranium deposits in the world awaited them.

Mr. Stanley Robson, President-elect, proposed the health of the guests. These included the High Commissioners for South Africa and the Federation of Rhodesia and Nyasaland, the Chief Inspector of Mines (Sir Harold Roberts), and the Director of the Geological Survey (Dr. W. J. Pugh). Too small a proportion of schoolboys of first-class ability had their interests directed to the mining profession, and the Institution was glad to welcome the presence of three headmasters (Merchant Taylors, Haileybury, and Harrow), also the chairman of governors of the Camborne School of Metalliferous Mining (Mr. Donald W. Thomas) and the rector of the Imperial College of Science (Dr. R. P. Linstead), whom he congratulated upon his recent appointment. Other guests included the presidents of kindred institutions and the presidents of some of the great mining concerns. He coupled the toast with the name of Lord Baillieu, chairman of the Empire Council of Mining and Metallurgical Institutions, and spoke of his great service at Washington during the war as head of the British Raw Materials Commission.

Lord Baillieu paid a tribute to the Duke of Edinburgh for his evident understanding, shown on this and other occasions, of the problems of industry in this country. His Royal Highness knew as they all knew that their standard of living, their way of life, the happiness and prosperity of British folk depended upon the efficiency of British industry, and if there was not enough production to buy their food and to procure the raw materials which sustained industry the days of this Commonwealth and Empire as a great Power were numbered.

## DEVELOPMENT UNDER ADVERSE CONDITIONS

His own earliest contacts with the mining industry were at Broken Hill. His father with other colleagues received the Gold Medal of the Institution, the highest honour in its power to bestow, and he himself shared with His Royal Highness the privilege of being one of the Institution's Honorary Members. Their President and he had been colleagues since the war in Africa, in Canada, in Australia, in Trinidad, and at home, and had shared common responsibilities. It was his belief that when the history of these times came to be written and the balance cast up, people would wonder how, in the face of two world wars, economic depressions, heavy taxation, and other sundry troubles, so much development had taken place in so short a space of time. For that result a great deal of credit must be given to the members of that Institution.

It had been his privilege during the years to work in close association with many of them, and he knew of their difficulties, even though directors of mining companies perhaps looked at matters from a rather different point of view on occasion from that of their technical advisers. They were confronting now a changing world, the dawn of the atomic age, but he believed that this country in the future as in the past would meet these challenges, and that England as the heart and core of the Commonwealth would continue to give of its best. No better record could be found than that which stood behind the mining and metallurgical industry of this country, and he raised his glass to its continued well-being.

## CUBA NICKEL—II

# Treatment of Cuban Nickel-Cobalt Ores

In our issue of May 6, 1955, the first portion of the following article described the nickeliferous iron ores of Cuba as the largest potential source of nickel in the world, and in the final instalment, appearing herewith, the treatment practice necessary for their economic exploitation is discussed. The article is a condensation of *Report of Investigations 5099*, by W. D. MacMillan and H. W. Davies, published by the United States Bureau of Mines.

In 1953 the direct mining costs of Nicaro Nickel Co. ores were \$0.313 per tonne and the rail haulage cost was \$0.22. Owing principally to the greater distance from Nicaro, the total estimated costs of exploitation of the Ramona-Mulo ores are \$0.45 per tonne higher than those of the Ocujal-San Juan ores. Using the direct rail cost from Ocujal to Nicaro for both operations, the estimated direct cost of Cuban Nickel Co. ores at Nicaro is \$0.735 per tonne, compared with \$0.533 per tonne for the Nickel Processing Corporation operations in 1953. The total estimated cost of mining and transporting the Ramona-Loma Mulo ores to Nicaro is \$1.30 per tonne, exclusive of interest, taxes or home office expense.

## THE NICARO PLANT

The nickel recovery plant at Nicaro was designed and built for the United States Government during the second world war at a total cost of \$31,767,552. The first stage was completed by December, 1943, when the plant produced its first nickel oxide. Full operation was achieved on December 3, 1944, when the battery of 12 Herreshoff furnaces was brought into commission. The plant was erected on a small peninsula known as Lengua de Pájara ("Tongue of the Bird"), which was favourable for deep-water piers, tailings disposal, sea water for cooling purposes in the power plant, and for general sanitary conditions.

The original plan called for reducing the oxide to metallic nickel at Wilmington, Del. Accordingly a reduction plant was erected at Wilmington at a cost of \$782,285, but it operated for only three months before being closed down on account of the high treatment cost. Nicaro oxide was then found to have certain inherent advantages that metallic nickel did not possess; as a result, a market was developed for the oxide. As stated previously, the nickel producing facilities were declared surplus in 1947 and no further production took place till 1952.

The first nickel-producing operation at Nicaro was a war-time venture and was therefore costly. Although the ore contained nickel, cobalt, iron and chromium, the project was limited to the recovery of nickel only. It was apparent that under these conditions, even though nickel could be produced at a cost less than the market price, competition with Canadian nickel would be handicapped by the fact that Sudbury ore contained valuable by-products, which were recovered.

## HIGH ECONOMIC RECOVERY

The prospects of profitable exploitation of the nickel-bearing iron ores of Cuba would obviously be enhanced by the economic recovery of all the valuable constituents. The gross value of the minerals in the ores, provided they can be recovered economically, is relatively high—nearly \$26 a ton. Deposits with equal value in the base metals, gold and silver, or molybdenum in the United States would be considered bonanzas. As yet, however, no process has been developed for recovering the iron or chromium, or the whole of the cobalt and nickel, in the Cuban ore. Recovery from the deposits in the Levisa Bay area is still limited to nickel. The iron in the tailings cannot be utilized because of its contained nickel and chromium.

Comparison of performances during the first and second periods of operation show a higher recovery rate during the second period. During 40 months of production in 1943-47, recovery of nickel averaged 69.32 per cent and operations resulted in a deficit of about \$3,000,000 without allowance for capital costs or payment of ore royalties. In 1953, the plant extracted 13,844 s.tons of nickel plus cobalt, representing a recovery of about 78 per cent of the contained nickel and 10 per cent of the cobalt. The latter metal, however, was not recovered as a separate product. The nickel, cobalt, iron and chromium not recovered had an aggregate value of \$16,000,000.

Permanent, profitable commercial operation is the long-range goal envisaged for the Nicaro plant. Although cost exceeded income by \$249,180 during the first 12 months of full operation after rehabilitation, earnings during this period suggest that the project may very nearly return its capital cost. The year's operations are considered to have improved the likelihood that the facilities may become a sound commercial operation under private management.

## TREATMENT OF NICKELIFEROUS ORES

Efforts to recover the nickel contained in Cuban iron ores date from almost the beginning of the present century. Over a hundred patents have been taken out covering processes to treat nickeliferous iron ores for the recovery of contained nickel. Yet so far the only method that has been operated commercially in Cuba is an ammonia-leaching process developed by Freeport Sulphur Co., which is used in the Nicaro plant. The following are the main steps in this process:

The ore received from the mine is blended in the wet-ore storage area. It is then loaded into two Stephens-Adamson travelling feeders and is conveyed to a Jeffrey double-roll crusher set to 4 in. It is then transported to the wet-ore building, where it is picked up by travelling cranes and delivered to four Amsco apron feeders on which the depth of the ore and therefore the rate of feed is controlled by movable fingers. These feeders discharge into four Allis-Chalmers unlined steel rotary dryers, in which moisture is reduced from 28 to 2.5 per cent.

In the grinding plant the ore is fed to one of two Pennsylvania hammer mills with grate-bar spacings of  $\frac{1}{2}$  in. and thence to three grinding circuits. Each circuit consists of a Pennsylvania hammer mill with  $\frac{3}{16}$  in. grate-bar spacings, a 16 ft. Sturtevant air separator, and a 36 in. x 9 ft. Hardinge conical ball mill. The air separators operate in a closed circuit and are set to yield a product averaging 90 per cent through 100 mesh, under which conditions each circuit has a capacity of 1,400 tons per day.

The ground ore is conveyed by a Fuller-Kinyon system either directly to the reduction furnace plant or to one of eight 10,000 ton concrete silos, used for storage and blending to maintain a furnace feed to constant analysis.

The reduction furnace plant consists of 12 Nichols Herreshoff furnaces 70 ft. high and 22.5 ft. in dia., with 16 hearths. Each unit can handle 300 tons per day. The reduced ore is discharged into six Jacoby rotary conveyors, each serving two furnaces, and is delivered to six Hardinge rotary



coolers, 60 ft. long x 9 ft. in dia., revolving in a bath of water at 6 r.p.m. After cooling it is mixed with ammonia liquor and pumped to the leaching system.

Leaching is done in three lines of thickeners, each line having three stages, operated countercurrently. Each stage consists of a block of turbo aerators followed by a 75 ft. dia. Dorr torque thickener. Air under pressure is introduced into the turbo aerators to dissolve the nickel and to oxidize and precipitate dissolved iron. The exhaust air from the turbo aerators is scrubbed with water to recover the ammonia with which it is saturated. Liquor overflowing from the first-stage thickener is sent to the ammonia and nickel recovery plant as pregnant liquor.

Washing is accomplished in two four-stage lines, each operated concurrently. The eight units in this system are 110 ft. Dorr torque thickeners. Fresh leach ammonia liquor from the ammonia and nickel recovery plant, together with the water from the air-scrubbing towers, is added to the last stage of each washing line. Overflow from the first stage of this system goes to the third stage of the leaching plant. Washing removes nickel absorbed on the ore and reduces the concentration of nickel in the liquor of the tailing. Tailing from the washing plant is pumped to the ammonia and nickel recovery plant for recovery of ammonia before pumping to waste.

At the recovery plant the pregnant liquor is aerated in turbo-mixers and filtered in three Sweetland filters to remove traces of iron and suspended ore. Treated pregnant liquor is pumped to 7 ft. dia. Semet-Solvay stills, where it is distilled with steam to remove ammonia and to precipitate the nickel as basic nickel carbonate. The overhead from the stills, containing ammonia and water vapour, is cooled and then fed to a battery of absorption towers where the ammonia is redissolved to form fresh leach liquor. Underflow from the stills containing the nickel carbonate in suspension is thickened and then filtered on two or three 8 ft. x 8 ft. Oliver vacuum filters. The filter cake is fed to an F. L. Smith "Unax" calcining kiln for conversion to nickel oxide. Nickel discharged from the kiln is cooled in a "Unax" cooler and conveyed to a storage bin, from which it is bagged for shipment.

For the second operation of the Nicaro plant some changes have been made in the flowsheet, as can be seen from the accompanying diagrams, and these have contributed to the improved rates of production and recovery.

### METALLURGICAL INVESTIGATIONS

The Nicaro Nickel Co. proposes to treat its Moa Bay ores with a sulphuric acid leaching process and to recover nickel and cobalt from the acid leaching solutions by a process similar to that developed for use in connection with the project of Sherritt Gordon Mines Ltd. at Fort Saskatchewan, Alberta. Upon completion of a pilot plant programme, facilities will be constructed in Cuba and the United States to produce approximately 15,000 s.tons of nickel metal and 1,500 tons of cobalt metal annually. The Cuban facility will be in the vicinity of the mine site and will perform a leaching and purification operation. The nickel-cobalt concentrate resulting from this process will be shipped to the United States to a second facility for separation and final processing of the metals.

The Bethlehem Steel Co. has large reserves of nickeliferous iron ore in the Mayari district of Cuba. These have been smelted for iron from time to time but have not been steadily exploited for many years due to technical difficulties. The company has developed a nitric acid process for extracting nickel, cobalt, iron, chromium, alumina and manganese. This process has been proved technically successful on a small pilot plant scale. The company has

allotted \$1,900,000 for a pilot plant to test its technical and economical possibilities on a larger scale.

The Bureau of Mines initiated research on Cuban nickel-bearing ores in 1952. At Tuscaloosa, Ala, it completed several laboratory flotation tests on Nicaro plant tailings. In a typical test, using Calgon, red oil, sodium oleate, and tall oil as reagents, a chromite concentrate was separated that had an analysis of 10.12 per cent Cr, and represented 51.5 per cent of the total Cr. in the ore. The reject product from this test assayed 0.77 per cent Cr. and carried 49.5 per cent of the total Cr. present. The samples were ground through 100-mesh before flotation. Recovery of the iron oxide from the Nicaro tailing by flotation was relatively ineffective.

Laboratory flotation tests were also made on samples of plant tailings, Cuban laterite, and serpentine ore after grinding through 200-mesh. However, little or no improvement in grade and/or recovery of Fe, Ni, Cr or Co was indicated with reagent combinations using a sulphonated petroleum oil as collector. Further samples were ground through 400-mesh and sink-float separations at a specific gravity of 2.94 were made on the minus-400-mesh, plus-20-micron fractions. Locking at this size proved too great, however, to yield a definite separation between gangue and valuable minerals present.

### OTHER EQUIPMENTS

At the Salt Lake City Experiment Station samples of laterite and serpentine were subjected to reductive roasting in the fluidizing reactor before nickel and other values were extracted by leaching. In an exploratory batch test, 86 per cent of the nickel was extracted from the residue obtained by reductive roasting at 550 deg. C. and fluidizing with a gas analyzing 3 per cent CO, 4 per cent H<sub>2</sub>, and 6.2 per cent CO<sub>2</sub>. When the serpentine was treated in a similar manner, but at 850 deg. C., only 50 per cent of the nickel was extracted. Test work was subsequently begun on additional samples of laterite and serpentine to investigate further recovery of nickel using the fluidized technique for roasting.

At the Pittsburgh Station, work was undertaken on the recovery of the associated minerals in the Cuban ores by pyrometallurgical methods. To utilize such ores as a source of iron and chromium, it would be necessary to reduce nickel and cobalt first to a low value of around 0.05 per cent. The initial exploratory work was carried out as part of the chromium-recovery programme on low-grade ores, but subsequently the selective reduction of nickel from Cuban ores was assigned as a separate project. Several selective reduction methods for nickel were accordingly applied to small-scale tests in an electric arc furnace. The investigators were able to bring down the residual nickel in the slag to about 0.01 per cent, giving a recovery of 98 to 99 per cent of the initial nickel of the charge ore, which produces a 20 per cent ferronickel that can be upgraded by selective oxidization.

Early in 1953, research was undertaken at the Pittsburgh Station to determine the best method of converting Cuban oxide into metallic nickel high in nickel content and low in both sulphur and carbon. Both electric smelting and reduction at lower temperatures were investigated. The latter process, in which the oxide is first pelletized and then reduced in saggars while passing through a tunnel kiln heated to around 2,000 deg. F., appeared ideal for conversion into metallic pieces suitable for charging into steel-making furnaces. The metallic nickel produced by this method analyzed 97 to 98 per cent nickel (plus cobalt); 0.05 per cent carbon, and 0.013 per cent sulphur. The recovery of nickel was nearly 100 per cent. The cost of a plant with a daily capacity of 50 tons of metallic nickel was estimated at \$381,100.

G.S.A. is at present carrying out intensive research on the production problems at Nicaro, largely through the Nickel Processing Corporation as contractor, in direct association with its operation of the mines and plant. The broad objectives are increased production, lower operating cost, recovery of useful by-products, and improvement and diversification of the present end product.

The process development plant at Nicaro is being used to test the Caron process of nickel-cobalt extraction and

separation. A pilot plant with a capacity of 300 lb. of dry ore per hour was built at Nicaro to study reduction, roasting and subsequent leaching to recover both nickel and cobalt. A sintering plant was completed at Nicaro early in 1954. Meanwhile, three alternative processes of known or potential value in treating Cuban ores are being examined by Battelle Memorial Institute, whose survey embraces processes that utilize nitric and sulphuric acids, as well as the ammonia leaching process.

## Function and Maintenance of Pneumatic Tools

Pneumatic tools play a major role in mining operations, and their effective maintenance is a problem of particular importance in the winning of ores from both underground and opencast sources. The function and maintenance of these equipments is described in the following article, which is condensed from a paper under the same title presented by F. B. Coombes, A.M.I.Prod.E., at a conference on "Compressed air as an aid to improved Productivity," held at Camborne on April 13-14, 1955. The author is chief designer at Holman Bros. Ltd.

Pneumatic tools fall into two basic groups; namely percussive machines and rotary machines.

Percussive tools are those which carry out a hammering action and in which a free-moving piston or slug reciprocates rapidly to strike the work tool. There is a wide range of sizes available to serve innumerable purposes. The weights vary from a few oz. to approximately 80 lb., reciprocating speeds from a few hundred up to 7,000 blows per min., and the magnitude of blows ranging from 1/80 ft. lb. The smaller sizes are usually valveless but the larger models are valve-controlled, this valve being independent of the reciprocating piston and not mechanically connected as in more general engineering practice.

### PISTON MOVEMENT

The piston movement in this class of machine is effected by fluctuating air pressures alternating on the two ends. The fit of this piston in its cylinder is required to be as airtight as possible, compatible with perfectly free, untrammelled movement. The same remarks apply to the valve in those machines which are so controlled. Consideration must also be given to the necessary film of lubricating oil which will also have some sealing effect. The machines are used in every conceivable plane and angle and the effects of gravity on valve and piston in these positions must be combated purely by efficient design and is very dependent on correct piston clearances.

It is obvious, therefore, that the manufacturing tolerances must be held at as close a level as possible, combined with a high degree of surface finish. It also emphasizes that the oil is employed for sealing purposes as well as the lubricating function, and stresses the importance of employing the correct types and grades.

### ROTARY TOOLS

Rotary tools are those which employ an air motor to drive grinding wheels, twist drills, reamers, taps and all the very numerous small tools employed in industry. They are usually powered by a slid-

ing vane type of rotary motor, although there are still a few piston type motors manufactured. The rotary motion of these motors is in some cases converted to reciprocating motion in such machines as nibblers, saws and files and also into impact energy, as in the very useful impact wrench, while their power/weight ratio is in the order of 2 lb./B.H.P., which is approaching what was considered aircraft engine performance before the advent of the modern gas turbine.

### HIGH ROTARY SPEEDS

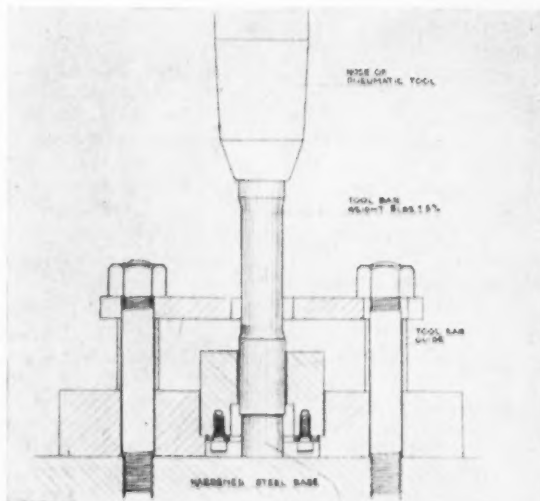
Rotor speeds are relatively high, ranging from 16,000/8,000 on those motors up to 1 h.p. and 8,000/3,000 on those from 1 to 6 h.p. Peripheral speed of the vane tips is between 3,000 and 3,500 ft. per min. High starting torque is a characteristic of this type of motor and it is normally well in excess of the running torque figure.

These motors are of very simple design, but their efficiency largely depends on internal leakage. To keep this to the lowest possible figure, it is necessary to maintain small working clearances and employ the correct type of oil in the correct quantity. The foregoing remarks reveal that the pneumatic tool is, of necessity, a precision-built machine and accordingly it is important that maintenance should be of a very high order. It is essential that this should be carried out in the form of preventive maintenance and this can only be really effective if the compressed air supply is in a proper condition to operate the tools.

### VALUE OF LUBRICATION

It is necessary that the lubricant used for a pneumatic tool should reduce the friction of the moving part to a minimum, assist in sealing internal leakage paths and still permit perfectly free movement. In addition, it must not obstruct small ports which are an essential factor in the functioning of the machine.

Where smaller machines which have not built-in lubricators are used, an efficient type of line oiler should be



Pellet test rig for percussive tools. In centre is steel pellet 1 in. in diameter to Brinell hardness 5.2

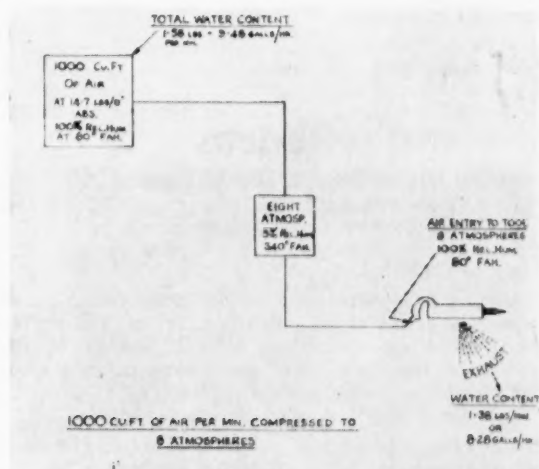
employed. There are many such devices available and it is good practice to use these in conjunction with a dirt separator. Machines having built-in reservoirs are usually provided with an adjustable needle valve or a porous element, such as felt, to control the quantity of oil passing into the machine. The quantity should be such that the

where the machines are used at some considerable distance from the stores, such as in a shipyard or in large and extensive works.

### AIR PRESSURE

An important consideration in the maintenance of compressed air tools is the damage done by air at too high or too low a pressure and more particularly, by wet or contaminated air. Most tools are designed to give maximum efficiency at 80/100 p.s.i. and if the pressure falls below 70 p.s.i., efficiency may fall by as much as 25 per cent and, alternatively, pressures of 110 p.s.i. or more result in accelerated wear and, possibly, actual failure of the parts subject to overstressing, as a result of this high pressure. Care should therefore be taken in laying out the air mains and, where necessary, pressure controllers should be employed to maintain the air pressure at the tool at the desired level.

Water is the enemy of the pneumatic tool and, unfortunately, it is always present. The only recourse open to the engineer is, therefore, to endeavour to remove as much as possible before it enters the tools. Consider the case where the ambient atmosphere is saturated, i.e., the relative humidity is 100 per cent and at 80 deg. F. and, for example, the compressor has a capacity of 1,000 cu. ft. of free air per min. and is compressing this air to approximately 100 p.s.i. gauge. In this condition this volume of air contains 1.58 lb. of moisture in the form of vapour which, if completely condensed out, represents a rate of 9½ gallons per hour. This air is delivered direct into the air lines and when it reaches the tool has fallen in temperature to that of the ambient atmosphere. Having been reduced to only one-eighth of its original volume, which was already saturated, the air will now deposit 1.38 lb. of water per min. as condensate. This represents water passing through the tools at the rate of



Compression temperature rise lost by conduction

exhaust air carries a very fine mist which will reveal itself on the back of the hand if held adjacent to the exhaust outlet.

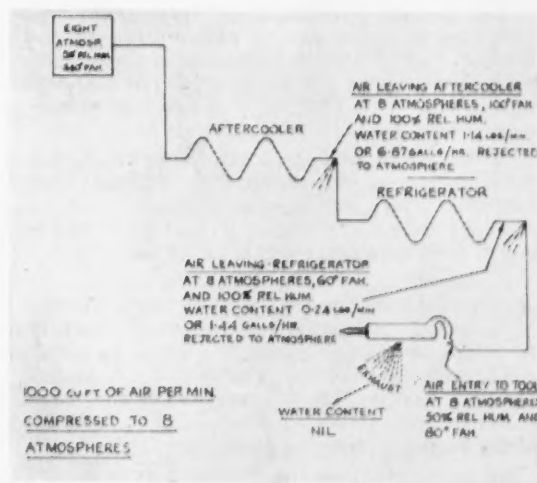
### TOOL MAINTENANCE

In rotary tools ball bearings are employed for most journals and where reduction gears are used a ball bearing grease will prove satisfactory for both. Whenever possible, all machines should be returned to the pneumatic tool stores at the end of the shift, where they can be properly examined, tested, cleaned and lubricated, ready for the next shift. Tools which are not up to standard and require overhauling can then be segregated for appropriate attention and thus save time and money in maintaining the proper rate of production.

Rotary tools should also be run with a rich supply of correct oil, which is easily inserted via the hose entry before storing. When it is necessary to store either type of tool for any length of time, an oil containing corrosion inhibitors, such as the Rustban or Ensis oils, should be employed for this purpose. Where maintenance of this order is possible, there should also be some method of testing each machine to ensure that when handed out to the operator it is up to its rated performance.

For hammers, excepting the very small valveless types, the pellet test is probably the most simple and efficient device. A mild steel pellet of very precise dimensions and of uniform material and hardness is subjected to hammering for a period, usually 10 sec. duration. The rate of reduction of length of this pellet related to the performance of a new machine will establish the condition of the tool coupled with observation of the air consumption.

In the case of rotary machines, it is possible to carry out a practical test such as drilling, grinding, etc., or some simple form of dynamometer or air brake can be employed; again, this should be coupled with the amount of air consumed and related to a new machine. This type of procedure will save considerable time and effort, particularly in cases



1,000 cu. ft. of air per minute compressed to 8 atmospheres with aftercooling and refrigeration

over eight gallons per hour. The effect of this in washing away lubricant and creating corrosion cannot be underestimated.

If an aftercooler is introduced immediately after the compressor, it is possible to extract over 1 lb. of this water per min., or 6.87 gallons per hour, and deliver the air into the mains at 100 deg. F. When this temperature has again fallen to 80 deg. F. at the usage point only .84 gallons per hour of water passes through the tools instead of the previous eight plus.



## Correspondence

### EXTRACTION METALLURGY AND THE CHEMICAL ENGINEER

The Editor, *The Mining Journal*.

Sir,

The research and teaching levels of mineral dressing in this country have risen considerably during the past 15 years. Most of the new techniques mentioned by Sir Harold Hartley in his presidential address to the Institution of Chemical Engineers, reported in *The Mining Journal*, April 29, 1955, are either in operation or receiving detailed attention.

It was obvious by 1944 that replacement of war wastage, together with the demands which would be made for engineering metals as standards of living rose could not be satisfied from the known ore deposits by exploiting time-honoured methods of concentration. Developments in the Commonwealth and United States were examined and as one result an extensive modernization of the Bessemer Laboratory of the Royal School of Mines was put in hand. Teaching facilities were expanded and laboratory space and equipment were organized for dealing with new fields of fundamental research together with an increased amount of ore testing. In due course a Mineral Dressing course was sanctioned by the University of London, giving the B.Sc. degree in Engineering Metallurgy (Mineral Dressing Option) and Associateship of the Royal School of Mines. This operates in close liaison with the existing Metallurgy courses, and its students therefore bridge the gap between mining and the production of high-grade concentrate suitable for heavy industry, smelting etc. Thus one of Sir Harold Hartley's suggestions is realized in teaching this applied science, which is the first essential step in progress. Without specialized training in the principles and practical application of surface physics, surface chemistry, particle dynamics, hydrometallurgy, electrochemistry, and ore microscopy, it is not possible to develop or control treatment methods of the kind needed in the exploitation of the low-grade ore deposits which must supply future needs.

The new Royal School of Mines course was the first exclusively concerned with teaching mineral dressing to degree standard, although institutions in other countries now have something similar. This subject is also taught to a lower level at some technical centres in this country.

In addition to the work of training engineers an increasing amount of research and ore testing is now done in the Bessemer Laboratory. Radio-tracing, X-ray study, supersonics and pressure leaching are among the techniques applied to problems which, when solved, should lead to improved recovery of the rare earths and obdurate minerals. These facilities are increasingly called upon by mining companies from the Dominions.

One present need is for an increased entry of young men who have reached the Inter B.Sc. standard in mathematics, physics and chemistry and who seek an interesting career abroad. Sir Harold Hartley is right in saying that "this new field is so wide and of such commercial importance that there is a strong case for the establishment of a national institute," etc. More men and women trained in the application of scientific method of ore treatment are needed. It is therefore to be hoped that increasing interest will be taken in the possibilities of a career in mineral dressing, both at the school and advanced level. While the shortage persists, something could be done if graduating chemists, physicists, and chemical engineers of suitable calibre would look into the possibilities of postgraduate training in mineral dressing at the Imperial College. Good rewards

and an interesting career await men and to a lesser extent women in the laboratories, reduction plants and hydrometallurgical works connected with the mines in all the Dominions.

Yours faithfully,

E. J. PRYOR.

May 6, 1955.

Bessemer Laboratory,  
Imperial College,  
South Kensington.  
London.

## Reviews

**Statistical Summary of the Mineral Industry (Production, Exports and Imports) 1948 - 1953.** Prepared by Mineral Resources Division, Colonial Geological Surveys. Published by Her Majesty's Stationery Office. Pp. 356. Price 27s. 6d., by post 28s.

This annual volume of statistical tables contains comprehensive details of the production, exports and imports of all important commercial minerals and metals used throughout the world. The new edition covers the important six-year period 1948 to 1953.

Production tables for copper, lead, tin and zinc show not only the outputs of the relevant ores in terms of metal, but also give the figures of smelter production. In the case of aluminium, figures for bauxite and natural cryolite are also shown. The section on coal deals with coke, briquettes and the chief coal by-products; moreover, as the same unit of weight is used in the section on petroleum which includes other natural products as well as the chief refinery products—comparison of the output and trade of these two principal fuels is readily available.

Full available statistics are given for the minor metals, lithium, columbium, tantalum and titanium, for example, which are becoming of increasing importance in modern industry.

**The Stock Exchange Official Year Book, 1955, Volume 1.** Thomas Skinner and Co. (Publishers) Ltd., Gresham House, Old Broad Street, London, E.C.2. Pp. 1,750. Price for the two volumes: £7 net; by post inland £7 3s. 6d.; abroad £7 5s.

Volume 1 of the 1955 edition of *The Stock Exchange Official Year Book* presents some special chapters and statistics on government, municipal and county finance, together with full information on government securities, British, Dominion, Colonial and Foreign and on the securities of municipalities and other corporate bodies. The boards of the nationalized industries are also included in this section.

The company section embraces all except the commercial and industrial and the mines sections, which are included in Volume 2 to be published in September. This Volume 1 contains details of railways, banks, breweries, electric lighting and power, financial trusts, land and property, gas, insurance, investment trusts, iron, coal and steel, oil, rubber and tea, shipping, telegraphs and telephones, tramways and omnibus and waterworks.

The principal new feature in this edition is a table to be found at the end of the investment trust section, compiled from the latest annual reports and accounts available, showing the book value of each company's investments, their valuation and their distribution both as to classes of security and geographically.

Particulars of many recent issues, received too late for classification, are given in the supplement near the end of the volume.

## MACHINERY AND EQUIPMENT

### Standard Buildings Using the Plastic Theory

The widespread prospecting activities at present taking place in many of the world's mining fields have brought attention to bear on the use of mobile housing and laboratory facilities during the initial stages of a mine's development, and on the need for the speedy erection of more permanent structures once payability has been established by prospecting and drilling operations. This latter application may provide scope for the storage building manufactured by Sanders and Forster Ltd., a steel erection providing many novel features.



A tied portal frame is the basis of the plastic theory of design

Based on the plastic or collapse theory, and using a tied portal frame as the basis of the design, a building has been developed which has the clean lines of the rigid portal frame, but which uses less steel than the conventional truss and stanchion type of construction. This reduction in weight is achieved partly in the design and partly by departing from traditional structural practice and substituting simpler and more logical connections. For planning purposes a 10 ft. module has been adopted, the bay length being 20 ft. This wide spacing of frames, 20 ft., as opposed to the more usual 12 ft. 6 in. or 15 ft., has many advantages from the user's point of view, and has been achieved without any substantial increase in the weight of the purlins. The method of fixing is by planting the stanchions in pockets left in the concrete bases, and concreting in after the building is levelled and plumbed.

The main features of this form of construction are its low cost, ease of transport and erection, robust construction, flexibility for planning purposes and ease with which extensions and alterations can be made. There are two standard widths of canopy for use with any span which are particularly suitable for tropical conditions.

### A Swedish Universal Excavator

Ernest Doe and Sons Ltd. have been granted sole concessionaire's rights in the British Isles of the Swedish ABS U25 Universal Excavator. This machine is described as being of revolutionary design and is about to be marketed in this country under the trade name of the Domobile Universal Excavator. The unit was demonstrated to the press yesterday at Ulting, Essex.

The ABS Universal Model U25 is of new standard boom design which increases the digging reach and loading height. Maximum boom length is 15 ft. 8 in., and maximum boom height is 9 ft. 5 in. Equipped with standard U25 boom, stick and 9 cu. ft. dipper the excavator has a digging height of 12 ft. 1 in., a radius of 16 ft. 4 in. and a dumping height of 7 ft. 2 in. Fitted with universal U25 grab and 20-30 ft. lightweight tube boom for all clamshell operations the machine has a height of 12 ft. 8 in. to 16 ft. 4 in. Crane capacity is up to five tons.

Fitted as a drag shovel the U25 on standard boom has a deep rigging reach of 9 ft. 1 in. at 20 ft. radius, while with drag-line bucket attachment the equipment operates on boom length between 24 ft. and 32 ft. 8 in., has a deep digging reach of

13 ft. 8 in. to 16 ft. 7 in., digging radii equal to boom length and dumping heights of 16 ft. 4 in. or 21 ft. Throughout, boom lengths quoted are given as examples only.

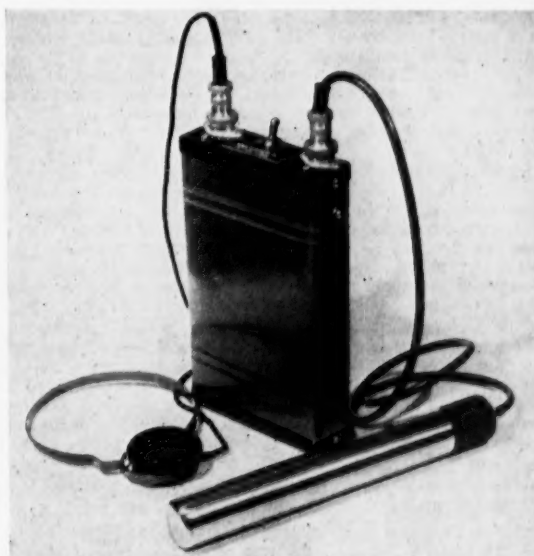
### Portable Prospecting Equipment

A range of four new instruments manufactured by Panax Equipment Ltd. are of interest in the field of geological prospecting. Of specific interest is the manufacturers' Model 3354, an instrument designed for the prospector requiring a cheap, light-weight, yet robust instrument providing audible indication only. This radiation detector is claimed to give a high degree of sensitivity. Indication is by headphone. The compact slope of this unit allows it to be carried in a jacket pocket.

Power is supplied from a small 67.5 volt h.t. battery, type B101 and a single 1.5 volt battery, type U2. The E.H.T. supply to the counter is fully stabilized at the correct working voltage. Fitted with a suitable counter this instrument can be used for the rough assay of beta radiations.

The Model 6950/C has been designed primarily for prospecting and geological survey purposes. The instrument has a large internally mounted gamma tube, type G.10 H, and incorporates a socket which automatically cuts out the internal tube when an external beta sensitive tube type B6 H is plugged in for use as a probe or in conjunction with a field assay unit. Indication is by meter calibrated in two ranges, 0-10,000 and 0-50,000 counts per minute.

The equipment operates from batteries consisting of one standard radio h.t. battery type B101, 67.5 volt and three U2, 1.5 volt cells. Battery life under normal intermittent use is approximately three months.



The Panax Radiation Detector Type 3354

Other equipment in this range include the Dekatron Scaler type D554, a complete counting equipment, and the mains-operated Ratemeter type 5054 designed for use with both scintillation and geiger counters.

It is interesting to note that in January of this year Panax Equipment Ltd. formed a company named Radiometric and Geophysical Surveys Ltd. to undertake prospecting for uranium. Since November, 1953, investigations have been carried out by Panax in Cornwall and Devon, and during the early months of 1954 the rights of the Wheal Edward property were acquired. Readers will recall that this mine was worked by P. Stein in 1952-53 and has been described by him in the October 3, 1952, issue of *The Mining Journal*.



## METALS, MINERALS AND ALLOYS

**COPPER.**—The uncertainty surrounding the copper price was removed at the end of last week when Roan Antelope and Mufulira Copper Mines announced that from May 9 they would offer blister copper at a fixed price of £280 per ton to U.K. consumers. This price will remain fixed for 30 days from May 9 and thereafter it will be subject to variation at 24 hours' notice. In the event, however, of the price being altered the new price will remain fixed for a definite period. This new price affects only the sale of blister copper—sold at a discount—which forms the main output of the Rhodesian Selection Trust Group.

The L.M.E. copper price was a little easier in anticipation of the announcement but later on in the day recovered to its previous level. Nor did the announcement from the Board of Trade that it was inviting tenders for the sale of 15,000 tons of electrolytic copper for pricing and delivery over five months beginning June next affect the price levels.

The initial reaction in the United States to the new price reduction appears to have been one of surprise at the size of the reduction. Commenting on the new move American copper producers cautiously stated that it was too early to gauge the ultimate effect of the present price reduction. But there were many who believed that it might result in attracting more copper to the U.S. thereby reversing the trend apparent over the last year and a half.

If the drastic move initiated by the Rhodesian Selection Trust Group to haul down the world copper price to lower levels has done anything, it has touched off a wave of hope—or wishful thinking—that the copper price will gradually tend towards lower levels.

Evidence is not lacking that the supply position will soon begin to show improvement in the months ahead. U.S. domestic copper production is steadily increasing and is now approaching record levels. The effects of the recent export restrictions on domestic scrap and refined copper are now making themselves felt. Moreover, American owned copper companies operating in Chile have been granted tax reliefs and have also been given the "right" to market their own copper abroad. However, this "right" is subject to the supervisory powers to be exercised over exports by Chile's projected new copper department. But the new "copper department" is not expected to function for about another week or so and, meanwhile, the Chilean Government has ordered that sales of copper abroad are to be drastically curtailed.

Nevertheless, U.S. domestic producers do not anticipate any price increase on the present 36 c. level during the remainder of this year. At this price it is felt that the new wage agreements due to be replaced at the end of June will be replaced without too much trouble. This tendency to believe that the copper price is tending downward has manifested itself in cuts in dealer and customs smelter prices and copper buyers are less anxious to pay premiums for more forward deliveries.

On the other hand, nearby copper continues tight in New York, world consumption is running at a high level and there is growing evidence of latent demand building up in Europe. In fact, nearly all nearby supplies of copper have been sold out in New York at the producers' price of 36 c. per lb. and a slight price squeeze has begun to develop. Accordingly, dealers and customs smelters have raised their price by  $\frac{1}{2}$  c. per lb. to 39 c.

On Wednesday of this week the West German official gazette announced that permission had been given for the import of 25,000,000 marks worth of refined copper from the U.K.

Chile produced more copper during the first four months of the current year. Electrolytic production from Chuquimata totalled 46,500 tons and blister 29,300 tons. Potrerillos produced 15,800 tons of blister and El Teniente produced 10,700 tons of blister and 39,400 tons of fire refined. The total from January 1 to April 30 was 141,700 tons compared with 92,283 tons for the like period in 1954.

**LEAD AND ZINC.**—Lead and zinc producers have been cheered by the announcement from O.D.M. that the U.S. Government would be in a position to continue to purchase both lead and zinc towards long term stockpile objectives in 1955 and probably throughout 1956.

This news was contained in a letter sent by Mr. Arthur Fleming, Director of O.D.M., to Senator Wallace F. Bennett, of Utah. In his review of the current stockpiling position for these two metals, Mr. Fleming reported strong demand for lead and zinc on world markets and said that imports of the two metals into the United States for consumption had not in-

creased. An additional heartening feature in the present situation was that smelters' stocks for lead and zinc have declined substantially from their excessively high level in mid-1954. At present, lead smelter stocks total approximately 60,000 tons compared with about 97,000 tons on June 1, 1954, and zinc smelter stocks are now down to about 90,000 tons compared with 210,000 tons on June 1, 1954. The stronger position now reached has been reflected in the fact that some U.S. lead/zinc mines which had either virtually ceased to produce or which had closed down altogether have now re-opened.

Demand for lead has been good this week in New York and there has also been persistent demand for zinc, particularly prime Western. Special high grade zinc supplies continued very tight mirroring the sharply expanded use of this metal in automobile manufacture.

Indeed, domestic demand for zinc, primarily for May but also in part for June met with very good demand with consumers trying to buy on a flat price basis as a hedge against a possible price increase.

U.S. mine production of zinc in March was 45,468 s.tons compared with 39,389 s.tons in February. Slab zinc production was actively maintained in April but shipments were at a record level, so that end month stocks dropped for the eleventh consecutive month. Slab zinc output totalled 83,803 s.tons compared with 89,179 s.tons in March. The April figure—allowing for metallurgical conversion losses—comprised 39,623 s.tons of special high grade. Yet this accelerated production was unable to prevent stocks dropping from 12,045 s.tons in March to 6,659 s.tons in April.

American Metal Co. have reported that its important ore discovery in New Brunswick, Canada, known as the Heath Steele Mines, is progressing satisfactorily, but that the ore deposits should be grouped as lead-zinc-copper ores rather than being classified separately as lead-zinc ore and as copper ore. It is now estimated that the positive and probable ore reserves amount to 7,200,000 tons. This figure is based on diamond drilling operations.

**TIN.**—Tin has been a slow but quietly steady market both here and in New York. However, this may be only a prelude to improved market conditions, which will surely come if there is much further deterioration of the political situation and of the labour picture in the East. This has already helped to impart a firm undertone to the market and has been further strengthened by the growing belief that the Texas City tin smelter will continue in operation for another year which could result in a percentage of tin production still being allocated to the stockpile.

Moreover, the U.S. and Indonesia have agreed on a three months' extension of the expiring 1952 tin purchase agreement. The decision to extend the contract was made at the beginning of this month in conferences between U.S. and Indonesian representatives in Washington. But whereas the original agreement covered both tin metal and concentrates, the extension applies only to concentrates. It is reported that the present three months' extension will give more time for a Congressional decision to be taken on the future of the Texas City smelter. As previously announced, the Senate has already approved a resolution to extend the operations of the smelter for another year but the House of Representatives has not yet acted on the proposal. A House decision is expected within the next three months and if it falls in line with the Senate the next move would be to enter into discussions with Indonesia for the supply of tin concentrates for another nine months.

World production of tin metal in the short month of February declined to 14,200 tons from 16,700 tons in January, due mainly to the fall in production from Malaya and from the Belgian Congo. Nigeria produced 662 tons of tin concentrates in February and the output from the Netherlands was estimated at 2,260 tons. In March, Malaya produced 5,189 tons and exported 7,589 tons. The export figures for March were well up on those for April which totalled 5,177 tons of which 3,671 tons were consigned to the United States, 555 tons to Europe, 453 tons to British possessions, 403 tons to other countries and 95 tons to the U.K.

World stocks of tin at the end of January, according to statistics released by the International Tin Study Group, totalled 65,600 tons compared with 71,800 tons at the end of December. The end-February stocks in Malaya amounted to 6,800 tons, while at the end of March, U.K. stocks totalled 9,600 tons.

World consumption of tin metal is still expanding and consumption rose from 11,400 tons in January to 11,800 tons in

February. Figures so far available for March estimate U.K. consumption at 2,057 tons—the highest figure recorded for any one month since October, 1952.

World tin plate production in February was estimated by the International Tin Study Group at 549,000 tons compared with 546,000 tons in January. In March Belgium produced 7,694 tons.

The Dutch Lower Chamber will discuss the International Tin Agreement on May 24.

**GOLD.**—The African labour force employed on the South African gold mines during April fell by 272 to a total of 329,730. Gold production for April totalled 1,192,966 f.o.z. compared with 1,210,513 f.o.z. in March.

**MANGANESE.**—The U.S. Interior Department told Congress last week that there was no need to extend the manganese stockpiling programme. Originally this was intended to encourage domestic production but not only had the industry one whole year's supply available but high grade ores were plentiful on the market and new sources of supply had been discovered in Cuba and Mexico. It will be recalled that a Bill to extend the stockpiling programme for five years and to increase Government buying to 105,000,000 l.ton units from the current 18,000,000 l.ton units was recently presented to the House of Representatives.

Against this pessimistic background is the news that the first major export shipments of high-grade manganese ore in the Citrusdal area Cape Province, South Africa, will leave Capetown at the end of this month. This will be the forerunner of a steady flow of manganese exports to markets in the U.S. and Europe which, it is hoped, will provide South Africa with a major source of dollar earnings.

The problem of transport which in the past has proved troublesome for manganese export, particularly from Postmasburg via Durban, is not expected to be severe. In fact, no difficulty is expected in obtaining trucks for the cargoes to Table Bay, 140 miles away, as the lorries which carry coal to the north invariably return empty to the city.

**NICKEL.**—Nickel is in very short supply. The position is reflected in the U.S. Commerce Department's decision to tighten further its nickel scrap export restrictions for the balance of the current quarter. The Commerce Department's move has been enforced by compelling exporters to show that they are unable to sell nickel scrap on the domestic market before they will be allowed to export it abroad.

The tight statistical position has created a difficult situation for the Allegheny Ludlum Steel Corporation, which has announced that unless there is a change in allocations it will have to restrict production of its nickel bearing steels. At present, the company is urging its clients to look at non-nickel bearing grades of steel to prepare themselves for adopting them in the near future. Manganese is a common substitute for nickel.

The shortage of nickel on the world market has persuaded M. Laffon, President of "Le Nickel," to expand the company's output to 10,000 tons a year by the end of 1959. This will involve the building of a dam and power plant on the Yate River and the erection of four electric smelters.

Le Nickel had already raised its output from 6,350 tons in 1952 to 8,400 tons in 1954 and M. Laffon, at the extraordinary general meeting of the company last week, expressed the belief that, even if the U.S. should stop or slow down its stockpile purchases, nickel supplies would remain tight. If when the modernization programme was completed, and world market conditions were still favourable, "Le Nickel" would keep its old plant in production in addition to the new smelters.

## The London Metal Market

(From Our Metal Exchange Correspondent)

It was announced on May 7 by Roan Antelope Copper Mines and Mufulira Copper Mines that the basis price at which they will sell copper to certain U.K. consumers will be £280 per ton c.i.f. This price, which became effective on May 9, is to remain fixed for at least 30 days, after which 24 hours' notice will be given of any variation and the new price will again be in force for at least 30 days. Of course a good deal of the metal to be sold on this basis is blister copper, but the actual disposal price has not been made public.

The London Metal Exchange prices have shown little change

from those ruling before the basis price became known, and, although there was an initial small decline at the opening of the market on Monday, by the afternoon quotations were back to those ruling at Friday's close. The Board of Trade has stated that of the approximate quantity of 28,000 tons of electrolytic copper they have for disposal they invite tenders for 15,000 tons for delivery and pricing over five months beginning June, and that the remaining 13,000 tons will be sold by tender at a later date.

Except for a burst of activity last Friday afternoon tin has been a quiet market both here and in America. However, the undertone is fairly good, helped by news of the extension for a further three months of the Indonesian contract for the supply of tin concentrates to the Texas City smelter, and the rather less favourable political and labour news from the East.

It now seems likely that the Texas City smelter may continue operations for another year after the end of June, and the tin produced may still be held off the market by delivery to the stockpile. On Thursday morning the Eastern price was equivalent to £731½ per ton c.i.f. Europe.

The lead and zinc markets have been steady with no outstanding feature calling for comment.

Closing prices and turnovers are given in the following table:

	May 5		May 12	
	Buyers	Sellers	Buyers	Sellers
Copper				
Cash .....	£305½	£306½	£312	£313
Three months .....	£291½	£292	£297½	£298
Settlement .....		£306½		£313
Week's turnover .....	6,950 tons		5,000 tons	
Tin				
Cash .....	£710½	£711	£714	£714½
Three months .....	£714	£714½	£715	£717
Settlement .....		£711		£714½
Week's turnover .....	680 tons		660 tons	
Lead				
Current half month .....	£103	£103½	£102½	£103
Three months .....	£103	£103½	£103	£103½
Week's turnover .....	4,150 tons		3,400 tons	
Zinc				
Current half month .....	£88½	£88½	£89½	£89½
Three months .....	£87½	£87½	£88	£88½
Week's turnover .....	4,000 tons		3,575 tons	

## OTHER LONDON PRICES — MAY 12

### METALS

Aluminium, 99.5%, £163 per ton	Magnesium, 2s. 4d. lb.
Antimony—	Nickel, 99.5% (home trade)
English (99%) delivered, 10	£519 per ton
cwt. and over £210 per ton	Osmium, £30 oz. nom.
Crude (70%) £200 per ton	Osmiridium, £40 oz. nom.
Ore (60% basis) 22s./24s. nom.	Palladium, £6 12s. 6d./£7 5s. oz.
per unit, c.i.f.	Platinum, £27 10s./£29
Bismuth	Rhodium, £41
(min. 2 cwt. lots) 16s. lb.	Ruthenium, £16 oz.
Cadmium (Empire) nominal	Quicksilver, £108
Chromium, 6s. 5d./7s. lb.	ex-warehouse
Cobalt, 21s. lb.	Selenium, 43s. nom.
Gold, 250s. 7½d.	per lb.
Iridium, £30/£32 oz. nom.	Silver, 77½d. f.o.z. spot and
Manganese Metal (96%-98%)	77d. f'd
£255/£265 according to	Tellurium, 15s./16s. lb.
quantity	

### ORES, ALLOYS, ETC.

Bismuth .. .. .	30% 5s. 0d. lb. c.i.f.
	20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semi-	£13 per ton c.i.f.
frangible) 48% ..	£13 per ton c.i.f.
" Refractory 45% ..	£10 2s. 6d. per ton c.i.f.
" Smalls 42% ..	£26-£27 d/d
Magnesite, ground calcined ..	£10-£11 d/d
Magnesite, Raw ..	105s. 3d.-108s. 1d. per unit c.i.f.
Molybdenite (85% basis) ..	240s./245s. c.i.f.
Wolfram and Scheelite (65%) ..	20s. 7d. nom. per lb. (home)
Tungsten Metal Powder ..	(98% Min. W.)
Ferro-tungsten (80%-85%) ..	17s. 7d. nom. per lb. (home)
Carbide, 4-cwt. lots ..	£37 6s. 3d. d/d per ton
Ferro-manganese, home ..	£53 17s. 6d. per ton
Manganese Ore Indian c.i.f.	
Europe (46%-48%) ..	79d./80d. per unit
Manganese Ore (38%-40%) ..	67d./69d. per unit
Brass Wire ..	3s. 0d. per lb. basis
Brass Tubes, solid drawn ..	2s. 4½d. per lb. basis

# THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Activity was restricted on the Stock Exchange during the past week. Gilt-edged continued weak due to selling of short dated stock by banks. Industrial shares, were firm despite the wait-and-see policy adopted by investors.

Mining shares were also affected by quiet trading conditions, and Kaffirs at the beginning of the week were marked down, principally due to lack of interest. No support was forthcoming from Johannesburg where political developments continue to cast a shadow on markets. Among finance houses, there were few remarkable changes but a noticeably firmer trend was apparent in Consolidated Goldfields and West Witwatersrand. West Rand Investment Trust shares turned a little easier in front of the report.

Among individual Rand mines, there was some recovery later in the week after earlier sagging. The older properties such as Crown Mines finished unchanged on hopes that production could be maintained for some years to come. The latest position from Durban Deep, however, caused some misgivings and the shares lost the turn. Developments by East Rand Properties at depth were considered encouraging and the shares rose slightly against the general trend. Rumours that uranium producers may soon obtain a better price for the metal caused improvements in Dominion Reefs, Luipaards Vlei and Randfontein. West Rand Consolidated also held up well. A further shaft will be sunk on the property to facilitate increased uranium throughput.

Orange Free State shares followed the movements of Kaffirs. The earlier fall was replaced by a recovery on Tuesday and Wednesday. Hopes of improved returns by Freddie's Consolidated caused a tentative rise in the shares. Geoffries also hardened, due to rumours that progress might soon be made in starting the Van den Heversrust area; illogically, Middle Witwatersrand failed to respond to this factor. President Brand slipped after last week's improvement. The company may not be able greatly to expand its output for at least two years. President Steyn came under the influence of Cape selling and dropped sharply. St. Helena, after being initially marked

down to 28s., recovered well and finished virtually unchanged.

Among West Africans there was little of interest to report. A slightly firmer trend was, however, noticeable in the market and some of the recent favourites gained the turn.

The latest figures from Cam and Motor were considered encouraging and the shares easily maintained their position. The Motapa returns for the March quarter were rather disappointing and it is understood that the company has encountered difficulties with its roaster unit.

Coppers, which last week fell back on the uncertainty over the metal price, showed good all round improvement. London Metal Exchange price levels were maintained and most shares recovered their former position. Chartered were particularly favoured and the latest figures from Mufulira and Roan Antelope caused a sharp improvement in Rhodesian Selection Trust. News that work is about to begin on the Kansanshi mine assisted Rhodesian Katanga. Provincial demand for Tharsis Sulphur was again a factor in the market and the shares rose to a point despite the ex dividend quotation.

The steady tin price failed to affect shares in the Eastern and Nigerian sections and changes were generally small and erratic. Beraltis, however, came in for profit taking at last week's high level and Bisichi went ahead well following favourable press comment on the company's prospects.

The firm lead/zinc market brought in buyers of Barriers. Most of the leading shares went ahead well, led by Consolidated Zinc. There was a revival in demand for Lake George.

Miscellaneous base metal shares showed little change. South African Collieries, however, were steady following the news that the South African railway system has been able to handle an increased tonnage of coal. Associated Manganese also hardened due to improved movements of ore from the property.

Canadians were generally good with Hollinger and Noranda outstanding. This can partially be attributed to the very high level of business activity in the United States.

FINANCE	Price May 11	+ or - on week	RAND GOLD contd.	Price May 11	+ or - on week	DIAMONDS & PLATINUM	Price May 11	+ or - on week	TIN (Nigerian and	Price May 11	+ or - on week
African & European ...	34	-	W. Rand Consolidated.	44/4	-	Anglo American Inv. ...	84	-	Miscellaneous) contd.		
Anglo American Corp'n.	7 1/2	+3d	Western Reefs	43/1 1/2	-	Cons. Diam. of S.W.A.	25/3	+3d	Gold & Base Metal ...	2/6	-
Anglo-French	21/6	-1/3	O.F.S. GOLD			De Beers Delf. Bearer.	5 1/2	+1/2	Jantar Nigeria	8/9	+4d
Anglo Transvaal Consol.	26/3	-1/3	Freddie's	4/7 1/2	+14d	De Beers Pld. Bearer	15 1/2	-	Jos Tin Area	13/9	-
Central Mining (El shrs.)	41/6	-1/3	F.S. Geduld	6/6	+3d	Pots Platinum	8/6	+6d	Kaduna Prospectors	2/44	-
Consolidated Goldfields	59/4 1/2	+7 1/2	Geoffries	4 1/2	-	Waterval	14/4 1/2	-	Kaduna Syndicate	2/44	-
Consol. Mines Selection	38/1 1/2	-	Harmony	35/3	-6d				London Tin	8 1/2	+3d
East Rand Consols.	2/6	+14d	Lorraine	11/1 1/2	-14d	COPPER			United Tin	2/9	-
General Mining	5 1/2	-	Lydenburg Estates	20/7 1/2	-7 1/2	Bancroft	41/9	+104d	SILVER, LEAD, ZINC		
H.E. Prop.	9/7 1/2	-	Merziespruit	11/9	-3d	Chartered	57/6	+2/9	Broken Hill South	53/-XD	+9d
Johnnies	37/6	-	Middle Wits	17/6	-1/2	Esperanza	4/9	+3d	Burma Corporation	2/3	-3d
Rand Mines	3 1/2	-	Obits	3 1/2	-	Messina	7 1/2	-	Consol. Zinc	47/3XD	+1/7 1/2
Rand Selection	41/10 1/2	-9d	President Brand	3 1/2	-	Nchanga	13 1/2	-	Lake George	13/3	+1/3
Union Corporation	39/3	-	President Steyn	71/10 1/2	-7 1/2	Rhod. Anglo-American	98/6	+3/6	Mount Isa	52/9	+9d
Vereniging Estates	4 1/2	-	St. Helena	29/3	-	Rhod. Katanga	21/-	-	New Broken Hill	34/9	+1/3
Wits	41/10 1/2	-7 1/2	Virginia Ord.	14/6	-	Rhodesian Selection	35/1 1/2	+1 1/2	North Broken Hill	72/6XD	+1/3
West Wits	39/6	+9d	Welkom	21/9	-	Rio Tinto	54	+1 1/2	Rhodesian Broken Hill	12/1 1/2	+6d
			Western Holdings	4 1/2	-	Roan Antelope	24/9	+9d	San Francisco Mines	21/6	+6d
						Selection Trust	70/7 1/2	+1/10 1/2	Urwira	6/10 1/2	+3d
						Tanks	7 1/2	-	MISCELLANEOUS		
						Tharsis Sulphur Br.	6 1/2XD	-	BASE METALS & COAL		
									Amal. Collieries of S.A.	49/44	-
									Associated Manganese	38/1 1/2	+104d
									Cape Asbestos	11/6	-6d
									C.P. Manganese	37/3	-9d
									Consol. Murchison	62/6	-
									Natal Navigation	2 1/2	+1 1/2
									Turner & Newall	105/-	+1/2
									Wankie	18/-	-3d
									Witbank Colliery	4	-
									CANADIAN MINES		
									Dome	\$30	-
									Hollinger	\$43 1/2	+3 1/2
									Hudson Bay Mining	\$111	+3
									International Nickel	\$118 1/2	+2 1/2
									Mining Corp'n. of Canada	\$74	+4
									Noranda	\$185	+14
									Quemont	\$18 1/2	+1 1/2
									Yukon	\$4/3	-
									OIL		
									British Petroleum	77/6	-1/3
									Apex	29/-	+2/-
									Attock	46/3	+1/10 1/2
									Burmah	6	+ 1/2
									Canadian Eagle	49/9	-
									Mexican Eagle	21/6	+1/-
									Shell	6 1/2	-
									Trinidad Leasehold	31/-	+1/3
									T.P.D.	23/9	-3d
									Ultramar	29/4 1/2	+1/6



## COMPANY NEWS AND VIEWS

### R.S.T. Group Copper Profits Maintained in March Quarter

Figures in respect of the three months ended March 31, 1955, reveal that copper profits earned by Mufulira and Roan Antelope Copper Mines have, despite losses caused by the recent strike, been maintained at the previous quarter's high level. Approximate average copper prices during the period have been £304 in respect of Mufulira's sales output as against £266 in the previous quarter and £313 as against £257 for Roan Antelope.

	1954	1954	1954	1955
	June Qtr.	Sept. Qtr.	Dec. Qtr.	Mar. Qtr.
<b>Mufulira</b>				
Sales (l.tons) ...	32,398	18,525	24,198	18,646
	(£000)	(£000)	(£000)	(£000)
Revenue ...	7,496	4,310	6,448	5,843
Costs ...	3,229	2,749	2,772	2,121
Difference in value of copper stocks	Dr. 387	Cr. 640	Dr. 110	Dr. 478
Surplus ...	3,880	2,201	3,566	3,244
London Expenses ...	Nil	Nil	Nil	Nil
Replacements* ...	209	277	267	196
Profit before taxation†	3,671	1,924	3,299	3,048

<b>Roan Antelope</b>				
Sales (l.tons) ...	32,242	16,598	22,524	19,872
	(£000)	(£000)	(£000)	(£000)
Revenue ...	7,455	3,796	5,879	6,055
Costs ...	2,940	2,707	3,078	2,253
Difference in value of copper stocks	Dr. 1,166	Cr. 697	Cr. 152	Dr. 549
Surplus ...	3,349	1,786	2,953	3,253
London Expenses ...	Nil	Nil	Nil	Nil
Replacements* ...	190	208	199	185
Profit before taxation†	3,159	1,578	2,754	3,068

\* Subject to revision when year's accounts considered.

† Estimated.

Cumulative figures for the first nine months of the two companies' financial years which end on June 30, are running well above those of the previous corresponding period. Copper sales by Mufulira during this period have risen to 61,369 l.tons from 52,069 l.tons while those of Roan Antelope have risen to 58,994 from 52,464 l.tons. Profits, subject to taxation, earned by Mufulira advanced to £8,271,000 as against £5,094,000 and in the case of Roan Antelope to £7,400,000 from £4,979,000.

### Geoffries and the V.D.H. Area

At the meeting of General Exploration Orange Free State held last week, Mr. C. S. McLean, the chairman, referred to operations being carried out in the van den Heeverst area. The company's consulting engineers, he said, were considering proposals submitted by the consulting engineers of Anglo Transvaal Consolidated Investment Co. and when agreement had been reached their recommendation would in turn be considered by the board. In reply to a shareholder's question as to when an application for a lease in the area would be made, and if this was likely to be done within the next two or three months, the chairman answered that on receipt of the recommendations awaited, the matter would be dealt with as expeditiously as possible.

### Rand Mines Maintains Revenue and Dividends

Revenue earned by Rand Mines, during the year ended December 31, 1954, was maintained at virtually the previous year's level. The company is closely associated with the Central Mining and Investment Corporation and holds a wide selection of gold shares both of Rand and O.F.S. companies. Besides its gold interests Rand Mines has stakes in a number of South African industrial undertakings.

Year to	Total	Tax-	Net	To	Carry
Dec. 31	Revenue	ation	Profit	Reserve	Forward
	£	£	£	£	£
1954	712,866	12,000	654,398	645,299	11,041
1953	726,123	Cr. 4,115	674,412	645,298	22,403

Dividends on the issued ordinary capital of £537,749 in shares of 5s. were maintained at 120 per cent for the third successive year.

Quoted investments shown on the balance sheet at £6,291,246 had a market valuation as at December 31, 1954, of £11,225,401. Mr. W. M. Frames is chairman. Meeting, Johannesburg, May 13.

### St. John d'el Rey's Recovery

Due to more profitable operations together with very much smaller loss on exchange, St. John d'el Rey, the Brazilian gold producer, made a sharp recovery during the year ended December 31, 1954.

Year to	Total*	Tax-	Net	Dividend†	Carry
Dec. 31	Profit	ation	Profit	Distribution	Forward
	£	£	£	£	£
1951	63,192	8,961	54,231	25,535	2½
1953	Dr. 338,012	9,285	Dr. 347,297	25,535	2½

\* After depreciation of £61,978 (1953 - £57,519) and losses on exchange of £40,069 (1953 - £303,116).

† Includes 2½% tax free payment on ordinary capital and 10% tax free on preference.

‡ After U.K. tax no longer required of £63,246 and transfer of £345,432 from reserves.

A dividend of 2½ per cent, tax free, was again paid on the issued ordinary capital of £621,413 in £1 stock units. Lord Rathcavan is chairman. Meeting, London, June 21.

### Konongo to Repay 1s. Per Share

As it has now become evident that no new orebodies are likely to be exposed at Konongo Gold Mines' concession in West Africa, and in consequence further heavy capital expenditure commitments are not expected, it has been proposed that liquid assets amounting to 1s. per share which can no longer be profitably employed in the business should be returned to shareholders by way of a capital repayment. Resolutions to give effect to this proposal, and subsequently to restore the company's capital to the present authorized amount, will be considered at an extra-ordinary general meeting to be held on May 24.

During the past financial year which ended on September 30, 1954, the total amount of ore milled on Konongo's own account rose to 34,325 tons from 29,810 tons previously. From this output gold produced amounted to 35,533 oz. as compared with 28,932 oz. previously.

The figures given in the following table, while including Konongo's own operations, also take into account that amount of ore milled on behalf of its neighbour, Lyndhurst Deep Level (Gold and Silver). This company's proportion amounted to 11,915 tons of ore milled as compared with 12,170 previously from which 14,299 oz. of gold as compared with 12,781 oz. were recovered.

Year to	Ore	Grade	Gold	Re-	Cost	Cost
Sept. 30	Milled	per ton	Produced	covery	per ton	per oz.
	tons	dwt.	oz.	%	s. d.	s. d.
1954	46,240	22.5	49,832	95.6	26 11	26 0
1953	41,980	21.0	41,713	94.7	27 9	27 11

Note—Of the above totals, ore milled on behalf of Lyndhurst Deep Level (Gold and Silver) accounted for 11,915 tons (1953 — 12,170 tons) from which 14,299 oz. were recovered (1953 — 12,781 oz.).

Reflecting the year's greater productivity, total revenue earned showed a marked expansion.

Year to	Total	Mine	Tax-	Net	Divi-	Carry
Sept. 30	Revenue	Expend're	ation	Profit	dends	Forward
	£	£	£	£	£	£
1954	452,179	212,384	103,250	59,253	52,637	63,714
1953	392,235	203,242	98,000	35,203	34,059	56,657

Dividends on the issued ordinary capital of £619,258 in shares of 2s. totalled 15 per cent thereby representing a rise of 5 per cent over the 10 per cent level which had been held for the nine previous years.

The company's ore reserve position as at September 30, 1954, comprised 221,490 tons having a value of 14.4 dwt. per ton over an average width of 73 in. At the present rate of milling, therefore, a number of profitable years can be anticipated without undue optimism.

In view of this strong technical position Konongo 2s. ordinary shares would not appear over valued at their present price of about 3s. at which a return of about 9½ per cent is obtainable. Moreover, operating results in respect of the first four months of the current financial year are encouraging. From 13,760 tons milled on Konongo's own account 12,664 oz. have been recovered. This compares with 10,610 tons and 11,638 oz. for the previous corresponding period. Mr. Robert Annan is chairman. Meeting, London, May 24.

## Offer of 21s. Per Share Received by Tati Co.

Following a preliminary announcement earlier this month by the Tati Co. it is now confirmed that an offer has been received from Glazer Brothers Investments Rhodesia (Private) to acquire the whole of the 308,866 issued 10s. shares of the company (free from encumbrances and with all rights attaching thereto) at a price of 21s. per share.

The directors of the company have agreed to accept the offer in respect of holdings owned or controlled by themselves which amount to 52,500 shares. Moreover, they have no hesitation in recommending that the offer should be accepted by all shareholders.

## RAND AND O.F.S. GOLD RETURNS FOR APRIL

Company	April 1955				Current Financial Year				Last Financial Year			
	Tons (000)	Yield (oz.)	Profit* (£000)	%	Tons (000)	Yield (oz.)	Profit* (£000)	%	Tons (000)	Yield (oz.)	Profit* (£000)	%
<b>Gold Fields</b>												
Doornfontein...	50	19,974	87.3	J	498	175,360	846.7	279	83,301	297.9		
Libanon	103	21,629	57.4	J	984	206,647	532.1	889	181,779	470.4		
Lupatards Viei...	127	20,768	634.2	J	1,151	112,574	5410.6	1,066	198,960	414.7		
Rietfontein...	27	6,034	20.4	D	106	23,935	81.4	110	24,737	96.0		
Robinson	72	16,524	14.0	D	332	71,659	91.2	378	99,546	88.7		
Simmer & Jack	115	19,513	14.7	D	467	78,824	58.5	507	81,400	49.2		
Sub Nigel	66	21,446	86.7	J	661	217,046	924.4	663	219,442	999.1		
Venterspost	116	28,350	70.2	J	1,067	263,118	639.4	1,071	249,793	577.0		
Vlakfontein	39	14,291	73.9	D	155	52,824	294.7	152	54,288	285.7		
Vogels	103	26,651	112.3	D	411	106,211	448.9	407	102,718	430.9		
West Drie	68	51,944	415.4	J	573	435,739	3403.0	454	333,116	2682.4		
<b>Anglo American</b>												
Brakpan	105	18,146	13.3	D	423	72,054	55.7	435	75,800	70.3		
Daggas	231	52,623	324.4	D	894	204,248	1259.4	860	200,676	1231.4		
East Daggas	98	16,354	48.1	D	380	63,630	290.2	371	63,063	185.8		
President Brand	43	31,175	242.8	D	159	111,465	837.8	—	—	—		
President Steyn	72	23,670	101.6	D	263	86,115	358.1	—	—	—		
S.A. Lands	96	18,122	56.4	D	381	71,590	226.3	394	72,453	210.5		
Springs	121	15,790	7.9	D	472	63,307	31.4	516	72,493	31.2		
Welkom	82	15,031	6.4	D	308	62,236	30.5	261	52,023	1.2		
Western Hldgs.	66	23,754	131.5	D	244	92,571	409.6	179	58,791	170.6		
West. Reef Ex.	120	21,814	52.4	D	473	87,632	218.6	450	89,395	260.5		
<b>Central Mining</b>												
Blyvoor	108	61,784	479.0	J	1,034	196,569	4583.5	981	576,567	4642.4		
City Deep	157	30,763	3.8	D	626	121,948	22.6	645	123,440	72.3		
Cons. M.R.	168	24,595	22.2	J	1,727	250,597	264.5	1,653	234,517	210.8		
Crown	291	47,766	48.6	D	1,579	998,145	194.1	1,068	172,274	190.0		
D. Roodepoort	173	29,411	48.8	D	697	117,866	191.1	675	112,003	156.5		
East Rand Prop.	207	49,761	156.5	D	836	197,805	607.0	753	172,051	447.4		
Harmony	54	18,667	70.1	J	355	126,468	407.0	—	—	—		
Modder B.	58	5,755	1.0	D	225	22,518	4.1	223	23,466	10.3		
Modder East	127	14,094	15.1	J	1,231	138,987	152.7	1,129	29,472	131.6		
Rose Deep	59	9,144	6.3	D	241	17,833	32.8	270	41,817	47.1		
Welgedacht	32	3,700	5.1	J	333	38,685	12.8	334	40,914	25.0		
<b>J.C.I.*</b>												
E. Champ. d'Or	20	1,450	6.2	D	79	5,999	123.6	94	9,158	51.5		
Freddie's Cons.	75	12,663	50.5	D	342	62,125	185.8	120	22,782	54.2		
Govt. G.M.A.	250	32,838	430.0	D	1,022	134,045	6147.2	1,020	131,618	120.1		
Randfontein	244	29,349	493.2	D	1,014	117,445	1358.6	1,126	155,797	32.6		
<b>Union</b>												
East Geduld	147	45,211	335.1	D	583	179,296	1346.8	523	160,794	1170.4		
Geduld Prop.	103	16,491	43.3	D	398	65,974	179.7	354	57,649	96.1		
Grootvlei	190	41,139	236.0	D	745	161,019	912.4	702	149,579	832.8		
Marievale	69	17,941	85.2	D	291	72,496	346.6	252	63,944	273.6		
St. Helena	102	26,116	121.0	D	410	91,805	450.6	307	67,442	194.2		
Van Dyk	78	12,995	1.2	D	317	52,592	5.7	311	54,200	9.1		
<b>General Mining</b>												
Ellaton Gold	L 30	99,005	44.6	D	119	36,607	188.9	99	25,509	87.4		
S. Roodepoort	L 27	5,893	20.0	J	274	59,310	202.0	273	59,517	202.4		
Stifffontein	L 85	33,373	208.3	D	334	131,315	829.2	308	98,493	531.7		
W. Rand Cons.	L 233	27,844	213.0	D	925	108,688	1863.8	867	114,083	693.4		
<b>Anglo-Transvaal</b>												
N. Klerksdorp	11	1,385	1.8	D	45	5,622	3.3	45	1,470	3.5		
Rand Leases	196	31,001	46.7	J	1,854	307,062	461.8	1,617	277,756	194.5		
Village M.R.	35	5,273	9.1	J	344	51,739	99.7	341	52,516	117.7		
Virginia	52	11,180	136.7	J	356	69,663	98.0	—	—	—		
<b>Others</b>												
N. Kleinfontein	109	13,061	8.0	D	421	50,889	22.0	421	53,052	66.6		
Nigel Gold	23	3,752	3.0	J	93	14,665	6.8	108	16,544	15.9		
Spaarwater	11	2,871	1.2	D	44	11,374	4.2	43	10,490	7.7		
W. Nigel	18	3,952	8.8	J	178	39,614	96.9	173	38,809	84.2		

\* Working profit figures includes Sundry Revenue

† Excludes gold sales at premium prices

J Gold and Uranium

D Gold and Pyrite

L Indicates loss

a Excludes £22,044 gross profit from Gold/Uranium subject to deductions

b Excludes £40,000 gross profit from Uranium subject to deductions

c After crediting £39,000 estimated Uranium revenue

d After crediting £11,022 estimated net revenue from Pyrite

e After crediting £290,000 estimated net revenue from Uranium and Acid

f After crediting £245,000 estimated profit from Uranium

g Previous year's figures not comparable

h Excluding Uranium profits

i After crediting £2,427 from Uranium before deductions of £625

After crediting £19,635 from Acid before deductions of £15,148

**METALLURGICAL GRADUATE**, with considerable experience in ore dressing and flotation, is required for a Diamond Research Laboratory associated with the Corporation. The salary offered will be commensurate with experience. Applications, stating age, marital status, qualifications and experience, should be addressed to the Appointments Department, Anglo American Corporation of South Africa Limited, 11 Old Jewry, London, E.C.2.

**THE PROPRIETOR OF BRITISH PATENT No. 616940** for "Improvements in mine props" desires to enter into arrangements by way of licence or otherwise on reasonable terms for the purpose of exploiting the invention and ensuring its full development and practical working in this country. All communications should be addressed to H. D. Fitzpatrick and Co., 3 Gray's Inn Square, London, W.C.1, and 94 Hope Street, Glasgow.

## GOLD COAST COLONY

Mining Group operating in the Gold Coast has vacancies for the following categories:—

## MINE CAPTAINS/UNDERGROUND SHIFTBOSSSES

Experienced First Aid Certificate and Mines Rescue Certificate required. Continuous contracts, tours of 12 months with three months' leave on full pay. Free passage, accommodation and medical attention. Provident Fund.

Apply by letter, stating position desired and giving date of birth and full details of experience, to Box 61, Walter Skinner Ltd., 20 Cophall Avenue, London, E.C.2.

**NATIONAL COAL BOARD** invite applications for a senior post of Work Study Engineer in the Work Study Branch of Production Department at London Headquarters. Duties will include general supervision of the application of work study in the Board's mines, co-ordination of the arrangements for training Area Work Study Engineers and close liaison with them (through Divisions) in the development of work study in coal mining, with prospects of eventually taking full charge of the Headquarters Work Study Branch.

Applicants, who must hold a First Class Colliery Manager's Certificate, should have a good knowledge of modern mining methods and lay-outs and considerable experience in negotiating with labour. The successful candidate, though based in London, will be expected to spend a good proportion of his time in the field.

The starting salary will be in the region of £2,000 to £2,500, according to qualifications and experience. The appointment is superannuable.

Write, giving full particulars (in chronological order) of age, education, qualifications and experience (with dates) to National Coal Board, Establishments (Personnel), Hobart House, Grosvenor Place, London, S.W.1, marking envelope TT/976. Original testimonials should NOT be forwarded. Closing date June 17, 1955.

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## Mining Men and Matters

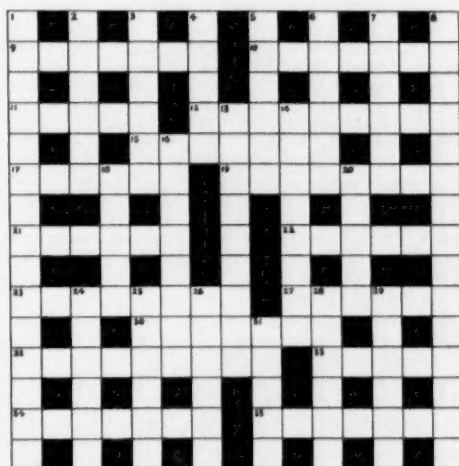
At the annual meeting of **The International Nickel Company of Canada, Ltd.**, held in Toronto on April 27, the following retiring directors were re-elected:—

**Edwin G. Baker**, Chairman, The Canada Life Assurance Co.; **Lewis W. Douglas**, Chairman, Southern Arizona Bank and Trust Co. and The Mutual Life Insurance Co. of New York; **J. Roy Gordon**, Vice-President of the company; **H. R. MacMillan**, C.B.E., Chairman, MacMillan and Bloedel Ltd.; **The Rt. Hon. Viscount Margesson**, P.C., M.C., Director of banking, electric, cement and other companies; **R. Samuel McLaughlin**, Chairman, General Motors of Canada, Ltd., and Vice-President, General Motors Corporation; **H. C. F. Mockridge**, Q.C., member of the firm of Osler, Hosken and Harcourt; **Theodore G. Montague**, President, The Borden Co.; **R. L. Prain**, O.B.E., Chairman of Rhodesian Selection Trust Ltd., of Mufulira Copper Mines Ltd., and of Roan Antelope Copper Mines Ltd.; **George C. Sharp**, member of the firm of Sullivan and Cromwell; **John F. Thompson**, Chairman of the company; and **The Rt. Hon. Viscount Weir**, P.C., G.C.B., Chairman, G. and J. Weir Ltd.

**Brookhirst Switchgear Ltd.** announce that, from April 1, 1955, **Arthur Trevor Williams (Pty) Ltd.**, 16 Burlington House, Rissik Street, Johannesburg, South Africa, are appointed their sole selling agents for South Africa, the Central African Federation and Portuguese East Africa. **Arthur Trevor Williams (Pty.) Ltd.** have branch offices or representatives in Pretoria, Cape Town, East London, Port Elizabeth, Durban, Kimberley, Salisbury, Bulawayo, Gwelo and Ndola.

**Mr. J. N. MacDonald**, B.A., A.M.I.E.(India), Executive Director, The British Thomson-Houston Export Co., retired at the end of April, 1955, and **Mr. H. E. Wethered** has been elected to the Board to fill the vacancy.

**Mr. Laister Guy** has been appointed a director of **C. Tennant Sons and Co. Ltd.**



'UNICONE' CROSSWORD No. 5

ACROSS.—9. He'll help to raise your hare (7). 10. A double negative is indicated (7). 11. Meditated (5). 12. Trust them to play the game (9). 15. Its on the side (7). 17. Compare the world with it when you are on top (6). 19. Most real estate has such a value (8). 21. The noes do it (6). 22. "But it's my ----- they done the old woman in" (Pygmalion) (6). 23. Just real dirty work (8). 27. Often personified as Mother (6). 30. Men of some importance in Scotland (7). 32. It certainly will not win (9). 33. In short a deputy (5). 34. One can often confuse by quoting without this (7). 35. Desiree doesn't look so well (7).

DOWN.—1. Shakespeare gave him a name (3, 4, 2, 6). 2. We are usually having one nationally or internationally (6). 3. Play, spiv, play (6). 4. Necessary for the roarin'

game (5). 5. A organ fabric (6). 6. Eric progressed by this (6). 7. The great unwashed maybe (3, 3). 8. Shakespeare also named him (6, 2, 7). 13. Colonnade in the fairy manner (9). 14. Rodents eat it but it does them no good (8). 16. Well! (8). 18. Sing while you fish (5). 20. It sounds a goodly share (5). 24. Heather in the interior (6). 25. Employed by the sailor but it's overdone (6). 26. Getting on for a hundred tin yen (6). 28. Wake up please (6). 29. If it comes from the sea it's prickly (6). 31. Hi! Sir (Anag.) (5).

Solution on page 542



With the compliments of  
**THE 'UNICONE' CO. LTD., RUTHERGLEN, GLASGOW, SCOTLAND**  
MAKERS OF UNICONE FLEXIBLE JOINTS FOR ALL PIPELINES

## SCOTTISH AUSTRALIAN MINING COMPANY, LIMITED

The Annual General Meeting of the Scottish Australian Mining Company, Limited, was held at the Offices of the Company, 197 Winchester House, Old Broad Street, E.C., on May 5.

**Mr. John Norman Eggar** (Chairman) who presided said:—

Gentlemen, The Report and Accounts having been in your hands for the requisite period, may I take them as having been read? (Agreed.)

Last year I warned you that the output of coal mined by the three collieries—Crofton, Borehill and Lambton Central—from which we get royalties, was likely to fall off. In the event, the output was 86,679 tons, a falling off of 6,576 tons compared with the previous year. It must be remembered that these pits only produce coal from the Victoria Tunnel Seam, which is second grade coal. In the second half of the year the demand for these coals fell away, conditions worsened, and indeed a number of small collieries in the district were forced to close down. However, with the invaluable help of the agent in Newcastle, Crofton was able to keep going by reduction of men, output, and price. One of Lambton Central pits was compelled to close down in July, but a market was secured to keep the other pit going. The output since the close of the year has been fairly consistent at about 600 tons per week. Borehill was able to keep its market and increased its output by 2,000 tons. In all the circumstances, the total output must be considered satisfactory, but the outlook for these small collieries producing second grade coal is insecure. I should be well satisfied if the output for the current year could be maintained at its present level. Our royalty income showed some improvement because production from areas carrying a royalty of 1/6d. per ton, instead of 1s., increased.

Our Manager took full advantage of a good demand which prevailed throughout the year for home sites; 93 lots were sold, and as proceeds became available the Board distributed the surpluses realized. It is our intention to continue this policy. Our policy of disposal of the Lambton Estate in accordance with the demand of sites, rather than forcing sales, has been amply justified. We have managed through our coal royalties and income from investments to cover all expenses and yield reasonable dividends whilst the gradual disposal of the Lambton Estate has proceeded. In the result, distributions of surpluses amounting to 6/- per 4/- unit have been made since 1945.

Having regard to the continuing demand for land in the vicinity of Newcastle, the Board instructed the Manager to accelerate sales. Two areas, one of about 70 acres and the other about 180 acres, have been satisfactorily disposed of since the close of the financial year. It will be some time before these transactions are completed, but the distribution of surpluses will not be delayed longer than is necessary. Much of our remaining land, some 490 acres, consists of rough bush, steeply gullied and pitfallen in places, and may not be so readily saleable.

Coming now to the Accounts—

The profit for the year amounted to £988 as compared with £1,213 in 1953. Rents, royalties, interest, &c. show an increase of £507, and income from investments an increase of £214.

Administration expenses are up by £194.

Rates increased by £849, the rateable value of the Lambton Estate having been raised at revaluation to £A81,055 as compared with £A68,542 in 1953.

United Kingdom and Australian Income Taxes absorb £1,106, compared with £1,203, a decrease of £97.

Freehold property shows a decrease of £1,178, owing to the subdivision and sale of about 16 acres of the Lambton Estate. About four acres were also given to the Newcastle City Council for improvement of roads.

The Company's holding of £940 British Government securities, which appeared in last Balance Sheet, was sold during the year.

Other investments increased by £1,184, represented by a purchase of 5% Guaranteed Preference Stock and the first Call on a new issue of shares in The Broken Hill Pty. Co. Ltd., on which there remains a liability for further Calls amounting to £404.

Amounts due from purchasers of land largely account for the increase of £8,366 in the item 'Debtors and Pre-payments.'

Deposits at Call and balances at Bankers amount to £13,668, compared with £7,977 at December 31, 1953.

Movements on General Reserve are set out in the statement following the Balance Sheet. The Land Sales Suspense Account, which represents unrealized surpluses on land sales, amounts to £12,590, and should be realized within the next three years.

The report and accounts were adopted and a vote of thanks to the Chairman, Directors and Management terminated the proceedings.

## ST. HELENA GOLD MINES, LIMITED

Mr. J. S. Walker, the Chairman of the Company, in addressing Members at the Annual General Meeting held at Johannesburg on April 28, 1955, referred with deep regret to the death on November 5, 1954, of Mr. P. M. Anderson, who had been Chairman of the Company since its inception.

He stated that the tonnage milled in 1954 was 1,041,000 tons, representing an increase of 242,000 tons as compared with 1953. The yield at 4.52 dwt. per ton showed an improvement of 0.46 dwt. so that notwithstanding the disappearance of the premium on gold sold for industrial and artistic purposes the revenue per ton milled increased by 5s. 5d. While there were increases in European and Native earnings and railage rates and in the cost of stores and electric power, working costs fell from 42s. 9d. per ton milled to 41s. 10d. mainly due to development charges and overhead expenses being spread over the greater tonnage.

The improvement in tonnage milled and yield, together with the fall in working costs, led to a substantial increase in the working profit which totalled £757,917 as compared with £330,348 for 1953. The Net Profit was £686,911.

As the remaining capital funds became absorbed during the year £103,173 was appropriated for capital expenditure which totalled £391,976; £40,000 was transferred to Loan Redemption Reserve and the carry forward was £648,902 as compared with £105,164 for the year before.

The total development footage driven was 48,295 feet, and of the 21,085 feet on Basal Reef and sampled 12,990 feet, or 62 per cent., proved payable, averaging 13.0 dwt. over 31 inches, equivalent to 402 inch-dwt. Although there was a decrease in the footage sampled the percentage payability and the value showed satisfactory improvements over the 1953 figures, due partly to continuing good development results in the northern portion of the Mine.

The ore reserve increased by 750,000 tons to 2,750,000 tons. The value was 0.6 dwt. higher at 5.9 dwt. and the estimated stopping width increased from 51 to 55 inches.

During the first quarter of 1955 working results continued to improve steadily. The ore milled totalled 308,000 tons and the working profit was £329,578. Development footage totalled 13,563 feet, of which 4,755 feet were on Basal Reef and sampled, disclosing 2,810 feet or 59 per cent. payable, averaging 12.3 dwt. over 34 inches, equivalent to 417 inch-dwt.

The diamond drilling programme mentioned at the previous Annual Meeting was completed during 1954. Following this the site of the new vertical circular shaft, No. 2 Shaft, which was required to serve the north-eastern portion of the property had been selected. The collar and the foundations for the hoisting equipment needed for sinking had been completed. Good progress was being made with the erection of the necessary buildings and headgear and it was expected that sinking would start about the middle of this year. The shaft should intersect the Basal Reef Horizon at a depth of about 4,000 feet and it was intended to carry it down to a final depth of about 5,500 feet.

In view of the satisfactory development results the capacity of the Reduction Plant was being increased by a further 25,000 tons per month to over 125,000 tons per month and it was anticipated that the extension should be completed by the end of the current year. After No. 2 shaft had been completed it was proposed to increase the Reduction Plant by a further 25,000 tons per month to over 150,000 tons per month.

The cost of the new shaft and the extensions to the Reduction Plant were to be financed out of profits which the Mine should be able comfortably to provide over the period. This programme would involve an expenditure of about £4,500,000 and it was anticipated that about one-third of the amount would be expended in 1955, the balance being spread much more lightly over the following four or five years.

The Chairman added that in opening up the first mine in a new field the problems the Company had had to overcome were many and difficult. In addition, in the early years, there were a number of set-backs and disappointments. But the progress made in the past two years and the steady expansion of the scale of operations had been most encouraging and he was sure that Members could look forward with confidence to the future of the Mine.

In seconding the motion for the adoption of the Reports and Accounts, Mr. H. A. Tothill asked the Chairman to indicate how far the underground workings were from the common boundary with Western Holdings, Limited, and what values were being encountered in the northern area of the Mine. He also enquired whether it would be possible to declare a small dividend towards the end of the current year.

In reply, the Chairman stated that the nearest workings

were at present about 2,000 feet from the Western Holdings boundary. The values in the northern area up to March 1 last could best be indicated by the fact that since the inception of development payability had averaged 65 per cent. and the average payable value 463 inch-dwt. in that area compared with 49 per cent. and 343 inch-dwt. for the whole of the Mine since development started.

In regard to the question of a dividend, the Chairman stated that as indicated in his address, very heavy expenditure would be incurred during 1955 but that this would be much lighter in the following years. The Board was keenly aware of the desirability of declaring a maiden dividend as soon as possible and would do so as soon as circumstances permitted.

The motion for the adoption of the Reports and Accounts which was proposed by the Chairman and seconded by Mr. H. A. Tothill was carried unanimously. The retiring Directors Messrs. P. H. Anderson, J. Boyd, I. T. Greig and P. S. Hammond, were re-elected.

## EAST GEDULD MINES, LIMITED

Mr. T. P. Stratten, Chairman of the Company, in addressing Members at the Annual General Meeting held at Johannesburg on April 28, 1955, referred with deep regret to the death on November 5, 1954, of Mr. P. M. Anderson, who had been Chairman of the Company since its inception.

He stated that due to an improvement in the Native labour supply, particularly in the second half of the year, the tonnage milled in 1954 increased by 53,000 tons to 1,663,000 tons, compared with the previous year. The yield per ton milled was slightly higher at 6.15 dwt. so that the output of gold increased by about 5 per cent. to 511,389 ounces fine. Despite the disappearance of the premium on gold sold for artistic and industrial purposes the greater output resulted in an increase of £286,806 in the working revenue which amounted to £6,380,784. At the same time increases in the costs of labour, stores and power led to a rise of 1s. 6d. per ton milled in working costs, which totalled £2,610,951. The working profit was therefore £3,769,833, which is £85,609 higher than in 1953.

Provision for taxation amounted to £2,065,958 and after taking into account income from investments amounting to £57,874 and the other items detailed in the Profit and Loss Account, the net profit was £1,771,529 compared with £1,760,031 for the previous year. Capital expenditure was considerably lower than in 1953 and totalled £26,463. Dividends totalling 3s. 9d. per unit of stock, being 3d. higher were declared and absorbed £1,687,500. The balance carried forward was £608,645.

All the development work accomplished was on the Main Reef Horizon and the footage driven at 9,626 feet was 1,327 feet more than in 1953. 6,510 feet were on Reef and sampled of which 4,275 feet, or 66 per cent. proved payable, with an average value of 15.9 dwt. over 26 inches. Whilst the percentage payability was lower, the average value was appreciably higher than in the previous year.

The ore reserve decreased by 500,000 tons to 11,000,000 tons, the value and estimated stopping width remaining unchanged at 5.7 dwt. and 51 inches respectively.

During the first quarter of 1955 the tonnage milled was 436,000 tons and the working profit was £1,011,636. Development on Main Reef totalled 2,929 feet of which 2,245 feet were sampled, disclosing 1,765 feet or 79 per cent. payable, averaging 13.4 dwt over 27 inches.

Mr. Stratten recorded with regret the death of Dr. H. R. Raikes, who had been appointed a Director on January 1, 1954.

The Reports and Accounts were adopted, the appointment of Mr. E. J. Read to the Board was confirmed, and the retiring Directors, Messrs. C. B. Anderson and M. W. Richards were re-elected.

### CORRECT SOLUTION TO "UNICONE" CROSS-WORD No. 5 APPEARING ON PAGE 541

ACROSS : 9, Harrier; 10, Neither; 11, Mused; 12, Sportsmen; 15, Lateral; 17, Oyster; 19, Rateable; 21, Oppose; 22, Belief; 23, Villiany; 27, Nature; 30, Bailies; 32, Non-runner; 33, Locum; 34, Context; 35, Seeder.

DOWN : 1, The Moor of Venice; 2, Crisis; 3, Fiddle; 4, Frost; 5, Angora; 6, Little; 7, The Mob; 8, Prince of Denmark; 13, Peristyle; 14, Ratsbane; 16, Artesians; 18, Troll; 20, Allot; 24, Lining; 25, Abused; 26, Ninety; 28, Asleep; 29, Urchin; 31, Irish.

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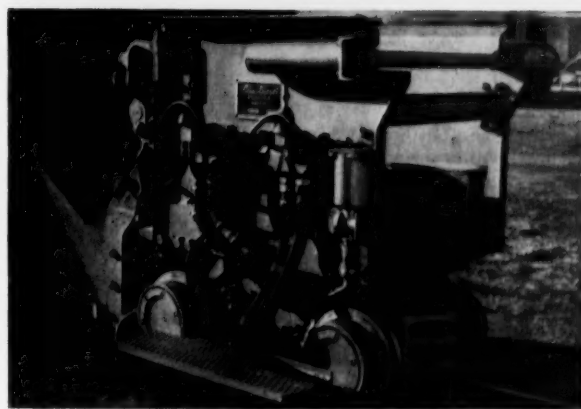
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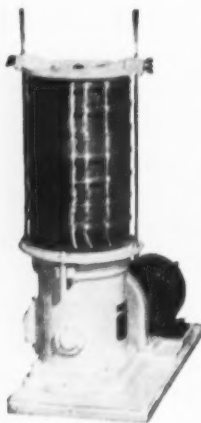
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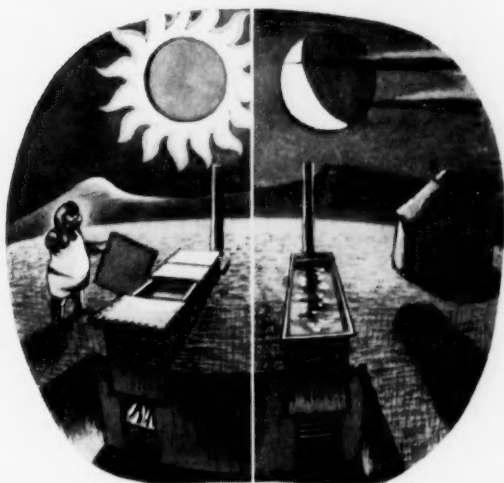
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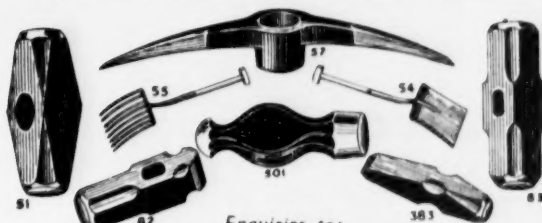
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